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STUDIES IN INDIAN ECONOMICS

EDITED BY

C. N. VAKIL

UNIVERSITY PROFESSOR OF ECONOMICS BOMBAY

STUDIES IN INDIAN ECONOMICS

A series of volumes dealing with the economic history and problems
of Modern India

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C. N. VAKIL

UNIVERSITY PROFESSOR OF ECONOMICS, BOMBAY

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POPULATION PROBLEM OF INDIA

BY

B. T. RANADIVE, M.A.

SIR PHEROZESHAH MEHTA RESEARCH SCHOLAR, UNIVERSITY OF BOMBAY

EDITED BY

C. N. VAKIL,

UNIVERSITY PROFESSOR OF ECONOMICS, BOMBAY.

LONGMANS, GREEN AND CO. LTD.

6 OLD COURT HOUSE STREET, CALCUTTA

53 NICOL ROAD, BOMBAY

36A. MOUNT ROAD, MADRAS

LONDON, NEW YORK, AND TORONTO

1930

PRINTED AT THE
BASEL MISSION PRESS AND BOOK DEPOT, MANGALORE

EDITOR'S PREFACE

The economic problem in Europe and America is how to keep up the high standard of life that the people have attained; the problem in India is how to raise the low standard of life which is so common in this country. Efforts are made in the Western world to keep production at a level high enough to secure a reasonable share to each, and if the desired equilibrium is not attained in this way, the other side of the ratio is worked upon; in other words, population is restricted by artificial means. Though signs of such restriction are not wanting in India, the country as a whole is ignorant of these methods. Population in India grows and grows without caring whether there is a proportionate growth in production. Fears are entertained in some countries in the West, that the race may die out because adequate replacement in the population does not take place. Fears may well be entertained in India that the race may die out by stagnation, because large numbers of people live in such a low state of vitality that the slightest shock of famine or disease is enough to take away not thousands but millions of people.

Among the chief remedies for this situation may be mentioned (1) sanitary and medical arrangements for the prevention of the disastrous effects of disease, (2) steps to prevent the horrors of famines and floods, (3) changes in social customs which lead to increase in population, and (4) above all a systematic and comprehensive effort for increased production both agricultural and industrial. This opens up large social and economic questions which are certainly engaging the attention both of the Government and leaders of public opinion and each of which would require a separate study. It may be asserted, however, that the amount of energy which is required for carrying out these remedies is not coming forward, and the speed with which the remedies should be put into effect is not fully realised, because the intensity of the

problem is not properly appreciated. This is so partly because of ignorance of the subject, partly because vague ideas are afloat to the effect that India is not overpopulated, due to the fallacy of taking into account potential resources which are not available at the moment for the existing population. A proper co-ordination of the figures of the growth, or otherwise, of the population as revealed by the censuses, along with the statistics of production of the country during the same period, will enable us to realise the extent to which there is a want of adjustment between the two. In the present work, which is mainly an attempt to study the population problem from this point of view, the author has been able to establish after a careful analysis of available data, first, that there has been a maladjustment between production and population in the country for the last 60 years, and second, that this maladjustment is on the increase.

One may or may not agree with the remedy suggested by the author, namely, artificial birth-control; but if the main conclusions of this book are properly understood, for example, if it is realised that we have a huge surplus of population pressing on the principal industry of the country, and that this surplus is larger than that of the total population of the United Kingdom or Germany, we shall be in a position to appreciate the extreme gravity of the situation. It will then be realised by responsible leaders of public opinion on the one hand, and by the Government on the other, that the efforts now supposed to be in operation for the amelioration of the people of India are neither prompt nor adequate, and that a more comprehensive scheme of action with re-doubled energy needs to be put into effect, with the promptness and enthusiasm of a Mussolini if the masses of India are to be prevented from desperate remedies.

I may point out that this work was written by Mr. B. T. Ranadive during the years 1925-27, when he worked as a research scholar in this School under my guidance. It was submitted as a thesis for the M. A. degree, which was awarded to him with distinction. Since then the author has lost faith in the existing economic organisation of society, which is presupposed throughout the work.

This means that if he were to write the book over again to-day, his conclusions in some cases would be more radical because of the fundamental change in his economic outlook.

The object of this series of books is to find out the truth relating to Indian economic problems, and in doing so, all methods of work, and all points of view must have their due place. Though there are a few works relating to Population in India, readers will find that this is, in many respects, the first work of its kind and it is hoped that it will help in the better understanding of the economic problem in India.

C. N. Vakil.

School of Economics
and Sociology,
University of Bombay,
1st March, 1930.

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INTRODUCTION

Economic theories have been severely tested during and after the World War. Some have been modified; others have been completely revised. But the soundness of the Malthusian theory, proclaimed more than a century ago, has been once more established before a world which had belittled and almost forgotten the author of the *Principle of Population*.

Before the termination of the Great War, Malthus was generally talked of very lightly. The prosperity due to the Industrial Revolution had not yet come to an end. Men thought that it would continue for ever. The growth of well-being that followed, and the rapid increase in population that attended it, were thought to be a sufficient refutation of the pessimistic ideas of Malthus. The ratios of Malthus were discarded as untrue; a faster rate of subsistence rather than of population was thought to be the real law of Nature. The tendency towards diminishing returns was treated as one which had no place in the new economic structure in which everything seemed to be obeying the law of increasing returns.

But the War put an end to these vain hopes. Its termination gave a new lease of life to the Law of Diminishing Returns. It showed that the advantages due to the Industrial Revolution could not be secured for ever. It clearly indicated that the tendency towards diminishing returns was also applicable to the present economic structure of society, and that the 'increasing returns' observed over the preceding hundred years were only a temporary phenomenon. The war, of course, was only the immediate cause of the effects that followed it, while the forces tending to produce them had already been gathering strength some years prior to the outbreak of hostilities in 1914.

A new stimulus has thus been given to the Malthusian theory after the conclusion of the war; for with 'diminishing

returns' in industry, economists have begun to entertain serious doubts regarding the problem whether subsistence will be able to keep pace with population. Some have definitely predicted that if new sources of increasing subsistence are not found, the European population will be faced with a gradual reduction of the standard of living to the point of starvation. Nay, it is asserted that this extreme point has already been reached in some countries like Russia and Austria.¹

The world is thus returning to the position taken by Malthus more than a century ago. There is now a consensus of opinion that the rapid progress of production during the 19th century, which was once supposed to have disproved the Malthusian theory, was at best only a temporary phenomenon, a repetition of which is unlikely in the near future at least; and therefore it is impossible to maintain the population at the present rate of increase. Economists and statesmen alike now apprehend the pressure of population on the means of subsistence and the consequent reduction in the standard of life.

How far the Malthusian Principle, the effect of which even the rich and industrially advanced nations of the West have been forced to acknowledge, is applicable to this country, forms the central theme of this work.

To us, viewing as we do, the Malthusian theory as an immutable law of Nature, universally true, there can be no doubt of its application to any country and at any time. But the all-important issue is whether it operates in such a way as to produce more and more misery or more and more happiness. The idea that the Malthusian theory is consistent with human happiness, may sound quite novel in view of the mistaken notion that perennial misery is inevitably connected with the Principle of Population. But, as will be shown later on, only a misinterpretation of the Malthusian doctrine has given currency to this false notion.

The operation of the Law then may either produce misery or happiness. Till recently it generally resulted in extreme misery

1. J. M. Keynes—The Economic Consequences of The Peace.

and the commonest form of this misery was that created by want of subsistence *i. e.* poverty; which in its turn ushered into existence many forces like famine, epidemics etc. which tended to make the life of man more miserable. The conditions under which the Law is expected to produce happiness, may be found prevalent in Western societies, where postponement of marriage and artificial restriction of births are largely adopted as remedial measures to keep population far above what may be called the starvation line.

It is obvious that a country which allows its population to multiply up to the starvation line, or which suffers from the economic phenomenon of over-population, cannot hope to make much progress unless some measures are found to remove the pressure of population. And if a country refuses to mend such a grave state of affairs and chooses to travel at a rapid rate down the inclined plane of starvation, then it must be taken as a sure sign of its early destruction.

Whether a country has multiplied far below a rationally adequate standard of life, or has approached or transgressed the poverty line, can in our opinion, be judged by a reference to the calamitous checks to population, which are born out of poverty. If famines and epidemics are found to oppress the population of a country in any great degree, then it can be safely generalised that there is not enough food in that country to support its population adequately, and that population has multiplied beyond a reasonable standard of living; in short, that the country is overpopulated. The gravity of the above situation will be immensely increased if it is found that these positive checks show signs of increase rather than of decrease; for this will mean that day by day the country is finding it more difficult to maintain its population.

There are, of course, other ways of finding out whether a country is getting poorer, and therefore approaching the limit of overpopulation. For instance, a comparison of the estimates of national dividend made at different periods, is generally supposed to be a good test for this purpose. So also, a comparison between

wages and prices is generally made to ascertain whether the standard of living of the working classes is rising or falling. But in our opinion, where they operate, the positive checks can be taken as giving a truer and deeper insight into the problem of poverty and therefore of population. The average standard of life or average national income, is mostly an abstraction. The results of the positive checks, on the other hand, are concrete realities. One cannot be so safe in generalising on the basis of the former as in doing so on the strength of the latter.

In dealing with India then, though we have taken into consideration the standard of living, we have devoted more attention to the various checks to population. We have asked ourselves the question—In what manner is the Principle of Population making itself felt in India? Is it in a manner conducive to the general happiness of the great mass of Indian people? Or does it lead to the increasing misery of the millions that inhabit this country? The following summary will give a general idea of the scope of the work.

In the first chapter we have tried to show that the essentials of the Malthusian theory still hold true. The rapid growth of well-being and population in the 19th century in England and other countries, did not compromise in the least the position taken by Malthus. In the second chapter we have briefly surveyed the various checks that existed in Europe from time to time and have discussed their efficacy in solving the population problem. Our conclusion in this connection is that artificial restriction of births is the only form of preventive check which is mainly responsible in bringing about a happy adjustment between population and food-supply in the West.

The third chapter deals with checks to population in pre-British and ancient India.

The fourth, fifth and sixth chapters deal with the various checks to population that have been in operation in this country in modern times. We have tried to show that there are enormous restrictions placed by nature on the growth of population in India, and these operate only because of a lack of adequate sub-

sistence. We have also tried to prove that these handicaps are on the whole increasing and concluded that this indicates a growing mal-adjustment between population and food-supply.

In the seventh chapter we have shown that the movement of the Indian birth-rate is one long tedious history of the check given to it by famines and epidemics.

In the eighth chapter we have discussed the significance of our low standard of living, and have concluded that we have multiplied to the lowest point compatible with human existence, and that the ideal point beyond which population must not grow should be that in which a decent standard of life is made possible for all.

In the ninth and tenth chapters we have tried to discuss whether we can increase our production to satisfy the demands of our overgrown population. As regards extension of cultivation, we have observed that the rate of extension is already going down and that cultivation will not be extended merely because there is plenty of land; for land is not the only agent of production. The factor of capital, of which there is a comparative dearth in India, must be taken into account.

As regards intensive cultivation on Western lines, we have observed that such a possibility cannot be realised because of the poverty of our cultivator. We have also examined the possibility of increasing the produce by enlarging the holding and found that this also presented insuperable difficulties.

Lastly we have noted the tendency towards diminishing returns and inefficient methods of production as evidenced by the extreme sub-division of holdings.

In the eleventh chapter we have examined the possibility of removing the agricultural pressure by means of an intensive policy of industrialisation and found that even under the best possible circumstances, this remedy is not likely to be more than a mere palliative.

In the last chapter we have concluded that the remedy for India to get out of the Malthusian misery is not only to prevent the growth of population but also to reduce the existing

means of subsistence "The virus generation is stronger than the virus nutritive and is in conflict with it".¹

Another writer who clearly anticipated Malthus, not only in his fear of over-population and misery, but also in the operation of the checks to population, was Sir William Petty. According to him, every country in which the course of human fertility is not disturbed by a war or a disease, or any other circumstance, cannot fail to become over-numerous. In his *Political Arithmetic* he wrote :—

"This nation hath lost its politick rule, (here he alluded to the removal of the restraint on marriage) and is overspread with multitudes of men, nay multitudes of poor, so that to take care of all these, you say is wholly impracticable. To this I say, that no nation, if not plagued with war or diseases, but naturally it will grow overnumerous. Now the magistrate supreme ought truly to know the contents of his territory, and be able to lay out the possible subsistence of his subjects; as the wise grazier, to know how many beasts will be depastured in such a ground or how much seed will sow an acre."²

Other writers, who practically wrote in the same strain as Malthus, were Franklin, Wallace, and Townsend. Malthus quotes Franklin, from his "Observations Concerning the increase of Mankind and the Peopling of Countries," to the following effect :—

"There is no bound to the prolific nature of plants or animals, but what is made by the crowding and interfering with each other's means of subsistence. Were the face of the earth of other plants, it might be gradually sowed with one kind only, as for instance with fennel; and were it empty of other inhabitants, it might in a few days be replenished from one nation only, as for instance with Englishmen."

But it was left to Townsend to forestall completely, the Malthusian theory, and to some extent also the

¹ Strangeland—*Pre-Malthusian Doctrines of Population*.

² Petty quoted by Sadler in his *Law of Population*.

Malthusian phraseology. The following passage from his 'Dissertations on the Poor-Laws' will make this clear. He says :

"There is an appetite which is, and should be, urgent, but which if left to operate without restraint, would multiply the human species before provision could be made for their support. Some check, some balance, is therefore absolutely needful, and hunger is the proper balance; hunger, not as directly felt or feared by the individual, but as foreseen and feared for his immediate offspring. Were it not for this, the equilibrium will not be preserved so near as it is at present in the World, between the numbers of people and the quantity of food. Various are the circumstances to be observed in different nations which tend to blunt the shafts of Cupid, or at least to quench the torch of Hymen."

The Contribution made by Malthus

The long extracts, given above, clearly indicate how far the doctrine of population which gained so much fame at the hands of Malthus, was already predicted by a number of writers who preceded him. Quite original as his theory appeared to his contemporaries, men had not been wanting even at that time, who seriously challenged his claims to have made a new discovery. Indeed, one writer of his times went to the length of giving no credit whatsoever to Malthus and called him a mere copyist of Townsend.¹

It is, however, quite unjust to Malthus to say that he made no valuable contribution to the further elucidation of the Principle of Population. It must be admitted that he did not make any new discovery in saying that population always presses on the means of subsistence. Nor did he

¹ cf. Sadler—Law of Population, p. 45. After citing many parallel ideas and expressions in the books of Malthus and Townsend, of course to the advantage of the former, the author writes "Thus, not only the principle of population, to use Mr. Townsend's phrase, which Mr. Malthus has likewise adopted, but the proofs by which it professes to be demonstrated, the nature of the checks which restrain its increase, and even the precise period of its natural duplication, are repeated by the latter, with something more like the servility of a copyist, than the accidental coincidence of an original writer".

establish the truth of the Principle ; for he himself said that the facts, proving its existence had already been repeatedly stated and acknowledged. But it must be admitted that he collected a large amount of material and pressed it into the service of his favourite theory. His real contribution lay in giving a scientific shape to a tendency already known. His was perhaps the first work which raised the Principle of Population into a Law of Nature, not an occult or a mysterious one as Godwin thought, but one which could be easily explained by facts of common experience. Besides, in fairness to Malthus, it must also be stated that in many respects he differed from his predecessors in his interpretation of the Principle, and did not content himself with merely accepting what they wrote. In relation to previous discussions on the subject, the position of Malthus may be taken to be the same as that of Darwin with respect to the theory of evolution.

The Malthusian Law

We shall now briefly state the Malthusian theory as far as possible in his own words.¹

According to Malthus the one great cause which has impeded the progress of human improvement is "the constant tendency of all animated life to increase beyond the nourishment prepared for it".

"Throughout the animal and vegetable kingdoms Nature has scattered the seeds of life abroad with the most profuse and liberal hand ; but has been comparatively sparing in the room and nourishment necessary to rear them. The germs of existence contained in this earth, if they could freely develop themselves, would fill millions of worlds in the course of a few thousands of years. Necessity, that imperious, all-pervading law of Nature, restrains them within the prescribed bounds. The race of plants

¹ The quotations and references to Malthus are from the seventh edition of his *Essay on Population*.

and the race of animals shrink under this great restrictive law ; and man cannot by any efforts of reason escape from it." Thus population has a constant tendency to multiply beyond the means of subsistence "but as, by that law of our nature which makes food necessary to the life of man, population can never actually increase beyond the lowest nourishment capable of supporting it, a strong check on population, from the difficulty of acquiring food, must be constantly in operation. This difficulty must fall somewhere, and must necessarily be severely felt in some or other of the various forms of misery, or the fear of misery, by a large portion of mankind".

In no country in the world has the power of population to multiply been allowed to operate to its fullest extent, for circumstances and customs have always been in existence to check its growth. Yet so rapid is this growth that, in spite of such checks, the population in the Northern States of America has been found to double itself in less than twenty-five years. This is because the means of subsistence have been more ample, and the checks to population fewer, than in any of the modern states of Europe.

"But, to be perfectly sure that we are far within the bounds of truth, we will take the slowest of these rates of increase, a rate in which all concurring testimonies agree, and which has been repeatedly ascertained to be from procreation only."

"It may be pronounced, therefore, that population when unchecked, goes on doubling itself every twenty-five years, or increases in a geometrical ratio."

The rate at which food-production can be increased must be essentially different from that at which population increases. "A thousand millions are just as easily doubled every twenty-five years by the power of population as a thousand. But the food to support the increase from the greater number will by no means be obtained with the

same facility. Man is necessarily confined in room. When acre has been added to acre till all the fertile land is occupied, the yearly increase of food must depend upon the melioration of land already in possession. This is a fund, which, from the nature of all soils instead of increasing, must be gradually diminishing."

Therefore "if it be allowed that by the best possible policy and great encouragements to agriculture, the average produce of this island (Great Britain) could be doubled in the first twenty-five years, it will be allowing probably, a greater increase than could with reason be expected".

"In the next twenty-five years, it is impossible to suppose that the produce could be quadrupled. It would be contrary to all our knowledge of the properties of land. The improvement of barren parts would be a work of time and labour; and it must be evident, to those who have the slightest acquaintance with agricultural subjects, that in proportion as cultivation is extended, the addition that could be made to the former average produce must be gradually and regularly diminishing."

But to err on the safer side "let us suppose that the yearly additions which might be made to the former average produce, instead of decreasing, which they certainly would do, were to remain the same; and that the produce of this island might be increased every twenty-five years, by a quantity equal to what it at present produces. If we apply this supposition to the whole earth, we will be supposing a rate of increase much greater than we can imagine that any possible exertions of mankind could make it."

"It may be fairly pronounced, therefore, that considering the present average state of the earth, the means of subsistence under circumstances the most favourable to human industry, could not possibly be made to increase faster than in an arithmetical ratio."

“The necessary effects of these two different rates of increase, when brought together, will be very striking. Taking the whole earth.....and supposing the present population equal to a thousand millions, the human species would increase as the numbers, 1, 2, 4, 8, 16, 32, 64, 128, 256; and the subsistence as 1, 2, 3, 4, 5, 6, 7, 8, 9. In two centuries the population would be to the means of subsistence as 256 to 9; in three centuries as 406 to 13, and in two thousand years the difference would be almost incalculable.”

“In this supposition no limits whatever are placed to the produce of the earth. It may increase for ever, and be greater than any assignable quantity; yet still the power of population being in every period so much superior, the increase of the human species can only be kept to the level of the means of subsistence by the constant operation of the strong Law of necessity acting as a check upon the greater powers.”

To summarize, the Malthusian theory states that the population shows an inherent tendency to outrun the means of subsistence, inasmuch as, if unchecked, it will increase at least in a geometrical ratio, while subsistence, even under the most favourable circumstances, cannot increase faster than in an arithmetical ratio. As man cannot live without bread, the growth of population must necessarily be curbed by the operation of various checks.

An Examination of the Objections raised by the Critics of Malthus regarding the Geometrical Ratio

The main criticism against the Malthusian statement of the law of population has been directed against the validity of the ratios of increase of population and subsistence. The geometrical ratio of human increase, has been seriously challenged, by a few writers. It has been argued

that the increase which occurred in some of the American colonies and which Malthus has taken as indicative of the power of population, can by no means be taken as typical of the whole world, inasmuch as it referred only to a prolific section of the community. The assumptions that such a ratio demands are not to be found in any society normally constituted, and therefore to argue that population can double itself in so short a period as 12 or 15 or 25 years is absurd in the highest degree.¹ Moreover such an increase has not been found in civilised societies or countries except in a few cases.

The only reply to these objections is that Malthus himself never thought that the population of civilised countries actually doubled itself every fifteen or twenty-five years. He only pointed out a strong possibility in that direction if all the checks were to be removed. Nothing can support the Malthusian hypothesis more strongly than the objections of the critics that no old country in the world has ever shown such a rapid increase. (The followers of Malthus can easily turn this very fact in his favour by pointing out that it indicates a strong operation of the various checks laid down by him.)

(It should, however, be admitted that the period of doubling which is given by Malthus does not rest for its justification on foundations quite scientific.) The only evidence given by him in this respect is that furnished by

1 Sadler—Law of Population Book II, p. 10. "It (a calculation which leads to a geometrical ratio of increase) assumes that there are no aged persons in an entire community who have survived the reproductive period of life; that there are none weakly or deficient; and moreover, that there are no infants or children more or less remote from the period of fruitfulness of whom a considerable proportion is never destined to attain to it. Such calculations generally commence with Melchizedeks; they present to us their prolific pairs unincumbered with their father or mother, and, like ephemera, propagating as soon as they appear, and disappearing when they have ceased to propagate." Curiously enough, the way in which the increase is determined according to Sadler, is nothing but a restatement of the Malthusian hypothesis that population is not allowed to exert its full power owing to the operation of various checks.

some of the colonies in North America. But whether the old countries would have doubled their numbers in a like period, or in a shorter or a longer one, if all the checks to population had been removed, cannot be said with any degree of certainty. Unlike the arithmetical ratio of increase of subsistence, which has some scientific basis in the Law of Diminishing Returns, Malthus's geometrical ratio seems to rest on stray observations, made in the Northern colonies and the backward countries of America.¹

In spite of this, it may be said that even if it can be shown that the geometrical ratio of increase was an undue exaggeration of Malthus, his position is not in the least shaken unless it is disproved that population tends to outrun the means of subsistence. The principle emphasises, as we have seen, not so much the different ratios of increase of population and production, as the inherent tendency of man to multiply beyond his food resources.

Of course it is wrong to suppose, as some writers have done, that Malthus attached no importance to the ratios of increase,¹ for in answering the objections of his critics to his denial of the right of the poor to support, he says :—

“Those who would maintain this objection with any degree of consistency are bound to show that the different ratios of increase with respect to population and food which I attempted to establish at the beginning of the Essay, are fundamentally erroneous ; since on the supposition of their being true, the conclusion is inevitable.”²

And again he writes :—

“It has been said that I have written a quarto volume to prove that population increases in a geometrical ratio, but this is not quite true. The first of these propositions

¹ Marshall—*Principles of Economics*, and Warren Thomson—*A Study in Malthusianism*.

² Malthus—p. 490.

I considered as proved the moment the American increase was related, and the second proposition as soon as it was enunciated."¹

The above passages make it quite clear that Malthus did attach importance to the ratios. Indeed he seems to have regarded them as well-nigh unchallengeable. But in criticising the Malthusian theory, it should be remembered that the Principle rests, not so much on the arithmetical or the geometrical ratio, as on the combined effect of these two kinds of increase. A mere refutation therefore, of the Malthusian hypothesis regarding the ratios cannot affect the validity of the Principle, unless it is proved that the growth of subsistence is quicker than that of population.

X Theories Concerning Human Fecundity in their Relation to the Geometrical Ratio

Bearing the above caution in mind we shall now turn to a consideration of one or two important theories concerning human fecundity, which may be said to be opposed to the geometrical rate of increase. (When Malthus laid down that an unchecked population increases in a geometrical ratio, it may be said that he was contemplating a fixed quantity of human fecundity on an average.) Now this very assumption has been seriously challenged by Spencer and Doubleday. Spencer's argument is briefly as follows :—

Among the lower forms of animals such as fish etc., fecundity is at its highest because the rate of elimination is at its highest. Among higher organisms the forces tending to elimination being comparatively less, there is no need for a superabundance of fertility. His words are : "Given the dangers to be met with as a constant quantity, the ability of any species to meet them is, a constant

¹ Malthus—p. 491 footnote

quantity, too, and as this is made up of the two factors—power to maintain individual life and power to multiply—these cannot do otherwise than vary inversely”.

Man being the most developed animal, that is, his ability to combat with forces that endanger his existence being great, he is the least prolific of all creatures. And as he advances further he must tend to become comparatively less fertile, for cerebral development and a high cost of individuation which such an advance demands, are inconsistent with a high generative power.

Doubleday's argument is that every increase in human nourishment must necessarily be accompanied by a corresponding decrease in human fertility. He relied for his hypothesis on his observation that well-to-do families contain a less number of children whereas the poverty-stricken poor have comparatively large families. From this he concluded that a deficiency in food-supply produces an unplethoric man inclined to a rapid multiplication of the species.

It must be admitted without any reservation, that if the Spencerian argument could prove that as man advances in civilization his rate of increase must decline, and that too only owing to causes controlled by Nature, then the whole Malthusian theory must tumble down like a pack of cards. Malthus will be met on his own ground, inasmuch as it will be proved that Nature never intended that man should counteract the effect of his continuous progress by multiplying beyond what such progress will allow, but that she has made a discreet provision that he should secure the lasting benefits of such a development, and that too in a growing proportion, by laying down a progressive reduction in his rate of reproduction.

Spencer's theory as it stands tells us nothing of this sort. It only states that if the death-rate in human society is lower, the birth-rate also will be lower. This does not mean that the rate of increase will be effectively

lowered. The rate of increase may continue to be the same, while the birth-rate may decline considerably. This is obvious because it is not the birth-rate alone which decides the rate of increase, but it is the combined action of the birth and death-rates that determines it. Of course, it is evident that if the birth-rate is reduced beyond a certain limit, then howsoever great a decline may take place in the death-rate, the rate of increase will not be a rapid one, much less a geometrical one.

Moreover, if we apply the theory to modern conditions, it will be found that it cannot be proved. The recent decline in human fertility observed in European countries, has been found to be due to an artificial reduction of births rather than to any physiological change in the inhabitants of these countries. A discussion on the various causes of the declining birth-rate of these countries will be found in the following chapter. This also incidentally disposes of Doubleday's hypothesis, for, as will be proved in the following chapter, the small number of children in well-to-do families which he observed, was due to their control of births rather than to any decrease in natural fertility. The theories of both Spencer and Doubleday, therefore, cannot be taken as affecting the rate of increase given by Malthus.

Another important writer who has tried to dispute the Malthusian hypothesis of increase in population is Nitti. According to him, the natural tendency of man to better his condition will be an effective bar against an over-multiplication of the species, only if the structure of Society is so shaped as to give every citizen a chance to rise to a higher social status. Where the distinctions between the different strata of society are quite rigid and hide-bound, and consequently where the lower classes cannot by any effort hope to raise their position, there a high birth-rate can be naturally expected. Further, every improvement in the economic condition of a people must neces-

sarily mean a decreased fecundity, since such an improvement makes for greater individuation which is opposed to a high rate of generation¹.

It will be seen from the above that Nitti contemplates two ways by which a reduction in the fertility of a people may be brought about. He thinks that it may be due to some deliberate action on the part of man and also to a physiological change in him. So far as the second cause is concerned, we have already seen that the decrease in human fertility which has hitherto taken place is not due to natural causes.

As regards the decrease which may be brought about by the ambition of men striving to rise to a higher social grade, it is obvious that this does not compromise the position of Malthus. For it is clear, that in the absence of any help from Nature, such men must either practise moral restraint, that is, refrain from marrying or, if they marry must use devices to restrict births. These are but some of the checks already foreseen by Malthus when he said that population is not allowed to increase in a geometrical ratio owing to the operation of various checks.

We have now examined some important theories which disputed the reliability of the Malthusian hypothesis with respect to the increase in population, and we have found that none of the alternative theories advanced affect Malthus's position in the least. Incidentally we have remarked that the Malthusian ratio of geometrical increase within a period of 25 years rests on somewhat shaky foundations. But we have also pointed out that this does not in the least compromise the Malthusian theory. For the cardinal point of Malthus is that if within a given period and under the most favourable circumstances, subsistence can at the most be increased in an arithmetical ratio, population during the same period will tend to

¹ Population and the Social System—Nitti.

multiply in a geometrical ratio, but for the operation of various checks.

The Arithmetical Ratio of Subsistence Increase

We now turn to an examination of Malthus's ratio of subsistence increase and the general nature of the relation between the two ratios. Of all the parts of the Malthusian argument, the arithmetical ratio was the most severely attacked. Whilst there has been a general consensus of opinion in favour of the geometrical ratio among economists, there is a wide divergence of views with regard to the second ratio. This is so, evidently because the arithmetical ratio was suggested by a highly debatable law in economics whereas the former had no such basis.

The Position of Malthus regarding the Arithmetical Ratio

Malthus himself, as he tells us, took the arithmetical ratio as self-evident. But elsewhere he writes "...it must be evident to those who have the slightest acquaintance with agricultural subjects, that in proportion as cultivation extended, the additions that could be made yearly to the former average produce must be gradually and regularly diminishing". Again he states that the amelioration of land already in possession "is a fund, which, from the nature of all soils, instead of increasing, must be gradually diminishing". The apparent contradiction involved here, will completely disappear if we remember the following passage. "That we may be the better able to compare the increase of population and food, let us make a supposition, which, without pretending to accuracy is clearly more favourable to the power of production in the earth than any experience we have had of its qualities will warrant. Let us suppose that the yearly additions which might be made to the former average

produce, instead of decreasing, which they certainly would do, were to remain the same ;.....” It will be clearly seen from the above passage that Malthus did not believe that food could be produced in an arithmetical ratio, but he admitted such a possibility only as a great concession perhaps to his would-be critics. In his opinion such an increase could not be warranted by the known properties of the soil. In fact had he really believed that such an increase could take place, he would not have been able to substantiate his proposition that population tends to outrun production. If once he had admitted that production could be raised indefinitely, it would not have been possible for him to say that it could be increased only in an arithmetical ratio and not in a geometrical one. Such an admission would have made production of food mainly dependent on factors other than land, labour or capital. That is, it would have meant that given the extent of land available in a country or in the world, subsistence can be increased at any rapid rate provided the supply of labour or capital increases in the required proportions. This would clearly have meant the negation of the Malthusian theory, for Malthus himself admits that there are no limits to population, and it is also easily admitted that capital can be increased indefinitely. But Malthus is aware that he is making a big assumption, of course, in favour of the means of subsistence, and he is cautious enough to say, after he has pointed out the likely effect of the two different ratios, that “in this supposition no limits whatever are placed to the produce of the earth. It may increase for ever and be greater than any assignable quantity. Yet still the power of population being in every period so much superior.....”

It will be clearly seen from the above that the assumption of Malthus that subsistence increases in an arithmetical ratio was only a hypothetical one, made perhaps to anticipate future criticisms, and though he took it as one

of the two premises from which he deduced his famous principle, it cannot be treated as a fundamental part of his system. For, if we regard it as such, the whole Malthusian argument must inevitably fall. The vital part of his system is rather the tendency which he observed, towards diminishing yields from land—a tendency which points directly to the assumption he has made. Therefore, any criticism directed against the subsistence ratio, any proof that food has actually increased faster than in an arithmetical ratio, does not affect the Malthusian position in the least, unless it can be shown that such an increase negatives the fundamental idea underlying Malthus's rate of subsistence increase. To think that such a proof will compromise the argument of Malthus is to put forth the absurd suggestion that the central theme of Malthus's principle was that production increases in a given ratio. Still more absurd would it be to blame Malthus for assuming a hypothesis which cannot be proved by facts, and then argue on the basis of the non-existence of such a law, to the possible existence of a more rapid increase in subsistence. Malthus himself knew that his hypothesis was an unwarranted assumption, more so in the light of the tendency which he had noted with diminishing yields from land. He took it merely for the sake of argument and tried to show that even if he were to make this big assumption, population would outrun food-supply. It is quite unfair to Malthus therefore to argue that "beyond the arithmetical ratio theory there is nothing whatever in the essay to show why subsistence from land should not increase as fast as an 'unchecked' population,"¹ and ignore the underlying idea which allowed him to go so far and not further in making his assumption. This is nothing but misreading Malthus, who hypothecated the arithmetical ratio to make the utmost concession to the increase of subsistence that he could possibly think of,

¹ Cannan—Theories of Production and Distribution, p. 144.

under stress of the tendency he had already noted. It is, therefore, not proper for his critics to suggest that the proposition of Malthus, that food cannot be increased in the same proportion as population is based only on his arithmetical ratio. This assertion would be unjustified not in the sense that it overstates subsistence increase, but in the sense that it understates it, unless of course his critics controvert the basic idea which led Malthus to suppose that the rate of increase given by him was the highest that could be imagined.

This brings us to the tendency towards diminishing yields which Malthus noted or what is known in modern economic terminology as the Law of Diminishing Returns. In this connection it is argued that it is wrong to suppose that Malthus knew the Law sufficiently to be aware of its high importance, and therefore the arithmetical ratio which, according to him, denoted the rate of increase in subsistence, cannot be said to bear any relation to it. It is said "Malthus may, perhaps, display some liking of it (the Law) here and there in the first edition. In the second he certainly uses one of the principal ideas on which it is based as an incidental and subsidiary argument. In the later edition its existence is frequently recognised. But to imagine that the *Essay on the Principle of Population* was ever based on the law of diminishing returns is to confuse Malthusianism as expounded by J. S. Mill with Malthusianism as expounded by Malthus."¹ It must be admitted that if the above contention is true, then Malthus was certainly wrong in enunciating the principle in the way that he did. But there are passages in Malthus's book which make it clear that he had realised the Law sufficiently well to justify the conclusion he arrived at, though he might not have understood it in all its recent developments. But before we return to that, it is necessary that

¹ Edwin Cannan, *Ibid.* p. 144.

we should understand what is meant by the Law of Diminishing Returns.

The Law of Diminishing Returns

The law arises out of the peculiarity of land which, unlike the other agents of production, is fixed and unalterable in its supply. Population, that is, labour as has been pointed out by Malthus, and generally admitted by all, can be increased to any amount if circumstances are favourable and so also capital. Every increase in population, therefore, means an increasing demand on this fixed supply—a supply which, moreover, is not of the same quality, but one which may be said to be deteriorating as additional demands are day by day made on it. It, therefore, naturally follows that as population increases, the returns per fixed unit of land must diminish. Nor is it possible to secure an ever-increasing supply of subsistence from the richer quality of land for, here also, diminishing returns to the capital and labour spent on it soon begin after a certain point. The Law thus applies both to extensive and intensive cultivation and states that every extension of cultivation is necessarily followed by diminishing yields per fixed unit of land, and secondly, that other things being equal, every additional dose of capital and labour spent on a fixed unit of land, after a fixed point when maximum yields accrue to it, is bound to result in less than proportionate returns.

The proviso 'other things being equal' is made to allow for an increase in skill as indicated by new discoveries and fresh inventions, which may tend to raise the yield per unit of land. It has been found that the recent discoveries of scientific manures, and the new methods of application of power and machinery, have raised the yield from land enormously, where it has been found possible to use them. For instance, in England the yield of wheat per acre was 10 bushels before the enclosures came into being. After

the policy of enclosing lands was thoroughly carried out and better methods of production were adopted, it was raised to 20 bushels, and recently to as much as 40 bushels per acre.

The validity of the above generalization is not seriously challenged by anybody. But it is argued whether the tendency towards diminishing returns as thus modified can be called a law at all. For, as stated above, the tendency can only refer to a particular stage in agricultural skill reached by man, and thus ceases to have the universality of application which a law demands.¹ As 'human progress in every direction is considered to be indefinite, and illimitable, it therefore, naturally follows that 'Diminishing Returns,' far from being a law is only an abstraction of a pessimist's mind, or at the most a temporary tendency which need not be taken into account. It is further suggested that as the Malthusian argument is said to be based on 'Diminishing Returns' as a fixed Law of Nature, it must inevitably fail. In this respect, reference is always made to the brilliant record of the 19th century which made possible a great increase in the population of England in particular, and in general of other nations like Germany, which followed her in an intensive policy of industrialization, and it is asked whether these events cannot be taken as a sufficient refutation of the Malthusian theory.

The plausibility of the above reasoning is supposed to be so convincing, that we are asked either to accept it wholesale as a complete refutation of the Malthusian theory, or to prove that man is not progressive. Such a reasoning arises only out of the many mistaken notions about the Malthusian theory that have been abroad and that die hard. This necessarily leads us to the general nature of the growth of population and well-being in the 19th century. But before we turn to that, we shall try to

¹ Edwin Cannan—Theories of Production and Distribution.

prove the statement we have already made that Malthus was sufficiently aware of the Law of Diminishing Returns.

Malthus and the Law of Diminishing Returns

That Malthus knew the tendency of agriculture to give diminishing returns, is obviously clear from the passage in which he says, that melioration of land 'is a fund, which from the nature of all soils instead of increasing, must be gradually diminishing'; and also from the following lines which tell us that "the improvement of the barren part would be a work of time and labour, and it must be evident to those who have the slightest acquaintance with agricultural subjects, that in proportion as cultivation is extended, the additions that could yearly be made to the former average produce must be gradually and regularly diminishing".

But as we have seen, it is argued that Malthus had at the most a dim realization of the tendency towards diminishing returns, that he thought it to be a fixed natural tendency not to be counteracted by any progress in human skill, and that in view of the recent modifications of the Law of Diminishing Returns, which he could not foresee, his conclusions were unusually pessimistic. It can, however, be easily seen from the following passages that Malthus did make some allowance for an increase in skill and that he drew his conclusions in spite of that. For instance, he observes that when population tends to outstrip subsistence, it provides in some measure its own corrective by an intensification of the checks, and by making an increase in agricultural skill quite necessary. To quote him "In the meantime, the cheapness of labour, the plenty of labourers, and the necessity of an increased industry among them, encourage cultivators to employ more labourers upon land, to turn up fresh soil, and to manure and improve more completely what is already in til-

lage, till ultimately the means of subsistence may become in the same proportion to the population as at the period from which we set out". And again he admits that the time will probably never arrive when we shall be able to say that no further labour or ingenuity of man could make further additions to it, that is, the produce from land. But according to him "the power of obtaining an additional quantity of food from the earth by proper management and in a certain time, has the most remote relation imaginable to the power of keeping pace with an unrestricted increase of population." It is thus clear from the above that Malthus did not accept the tendency as a hard and fast rule, admitting of no qualifications whatsoever, and that he did take into consideration an increase in human skill.

Industrial Revolution and the Malthusian Law

We now turn to the contention that the fear of overpopulation is only an abstraction of a pessimist's mind, since the Law of Diminishing Returns on which it rests, is sure to be prevented in its operation by an increase in human efficiency, and that the events of the last century, which made possible an enormous increase in the population of European countries, have sufficiently disproved the Malthusian theory. As we have said before, the reasoning which argues from a mere increase in population to the rejection of the Malthusian hypothesis is based on one of the many mistaken notions about it. Malthus's critics have attributed all sorts of notions to him. It was once suggested that he was opposed to vaccination in as much as it interfered with the checks provided by Nature. It was also suggested that Malthus was an enemy to population and that he was opposed to any increase in it. The reasoning mentioned above is also of the same kind. It suggests that the Principle of Popula-

tion as laid down by Malthus could not allow of any increase in population to take place, especially with a rising standard of life. Malthus himself, however, had no such idea in his mind. For he writes "Europe is by no means as fully peopled as it might be. In Europe there is the fairest chance that human industry may receive its best direction. The science of agriculture has been much studied in England and Scotland ; and there is still a greater portion of uncultivated land in these countries". With regard to the world in general also, he admitted that an increase in population could take place, since, he wrote, "there are many parts of the globe, indeed, hitherto uncultivated and almost unoccupied." In the face of these clear statements it is strange how critics of Malthus can persist in thinking that an increase in population means the negation of the Malthusian Principle, which clearly points out that population will actually increase only as far as means of subsistence will allow ; but since it will always tend to outstrip production, its growth will always be curbed by various checks.

Increasing Returns and the Industrial Revolution

Other critics of Malthus object to his conclusions from a different point of view. They challenge his thesis that population tends to outrun production by referring to the events of the last century, which according to them have completely proved the non-existence of the Law of Diminishing Returns, by raising the standard of life of an increasing population. The normal tendency, they think, is towards increasing returns, and the tendency towards decreasing returns can in no sense be taken as a law, because at most it can supervene only as a temporary change. There was once a growing body of men who advanced such arguments, especially in the period when the giddy success of the industrial movement of the last cen-

ture was still at its height, but their number has declined since the termination of the World War, when even the rich nations of the West began to feel the pressure of "diminishing returns".

Such critics who discard the tendency towards diminishing returns in favour of one towards increasing returns, do so in the belief that the former is not universally applicable. According to them, every increase in human skill tends to postpone it, if not altogether to prevent it, and as human progress is limitless, the tendency may never be allowed to operate. At the most it may get a short breathing space. The tendency towards increasing returns on the other hand is a persistent one, because of the progressive nature of human efficiency. It can be truly called a law since it possesses universality of application. Any generalisation, therefore, based on the former tendency regarded as a law is, according to them, untrue.

This argument makes two important assumptions. *First, it implies that the Industrial Revolution with the growth of well-being which attended it, was a sufficient refutation of the Malthusian Law, and second, it suggests that because human progress is limitless, the increasing returns of the last century are sure to continue for ever, and therefore there is no possibility of population ever pressing on the means of subsistence.* We shall consider the second assumption first.

Malthus and Increasing Returns

Granting the capacity of man to progress as limitless, we wonder how such an argument affects the position of Malthus. He already makes a big concession to such critics when he places no limits to the produce that can be raised from the land. He never says that man is not progressive, or that an increase in his skill may not bring increasing returns from land ; but, according to him, such

a tendency will be only a temporary one. Population will again tend to multiply to the limit set by subsistence, and unless a provision is made for human progress to continue so rapidly as to provide sufficient food for a population increasing in a geometrical ratio, checks to such an increase will come into operation. The position of Malthus then is this, that while he places no limits to human progress, he questions whether the rate at which it is likely to proceed will be sufficiently rapid to produce enough subsistence for a population increasing 'unchecked'. On this point he expresses himself thus

"The power of the earth to produce subsistence is not certainly unlimited, but it is, strictly speaking, indefinite ; that is, its limits are not defined, and the time will probably never arrive when we shall be able to say that no further labour or ingenuity of man could make further additions to it. But the power of obtaining an additional quantity of food from the earth by proper management and in a certain time, has the most remote relation imaginable to the power of keeping pace with an unrestricted increase of population. The knowledge and industry which would enable the natives of New Holland to make the best use of the natural resources of their country must, without an absolute miracle, come to them gradually and slowly, and even then, as it has amply appeared, would be perfectly ineffectual as to the grand object ; but the passions which prompt to the increase of population are always in full vigour, and are ready to produce their full effect even in a state of the most helpless ignorance and barbarism."¹

According to Malthus, therefore, the question is not so much of the permanent nature of human progress but whether such progress will be sufficiently rapid to allow an unchecked growth of population.

¹ pp. 484-90.

The Relevance of the Objections raised by the Critics of Malthus

The argument of his critics, on the other hand, is that "Increasing Returns" is a permanent tendency because the progress of humanity is limitless. But they do not take into consideration the question of time. Their objection is thus beside the point. For, to say that human progress is boundless is not the same as to state that an increase in skill will always take place, within a sufficiently short period, during which an unchecked population may double itself. The general belief in the eternity of human progress does not compromise the Malthusian argument in the least; for the Principle of Population does not mean to provide an adverse comment on the permanent nature of human progress; but it is a statement of the relation between the rates of two kinds of growths, namely, the growth of population and the growth of human efficiency as evidenced by an increase in the produce raised from land.

The critics of Malthus, therefore, who try to refute his theory, must show that the tendency towards increasing returns which they have noted, is such that it will allow population to increase in a geometrical ratio without lowering the standard of life; or, they must challenge the hypothesis that population when unchecked tends to increase in the given ratio, and that therefore even a slow progress in human efficiency will be able to negative the Principle of Population. The second argument has not been attempted by any one because the tendency of population to increase in a geometrical ratio, when unchecked, is generally accepted. And the first argument presupposes that human progress takes place very rapidly, say, with the speed of a revolution, in order to keep pace with the increase in population which doubles itself in a short period, if unchecked. But if we turn to facts, the contrary

appears to be the case. With the exception of the Industrial Revolution, there cannot be said to have been any revolution in the methods of production, especially agricultural production. The onward march of humanity has been essentially of an evolutionary type. It has generally resulted from accumulated knowledge of many a century. And above all, agriculture has been stagnant for centuries. Even to-day in India the peasant is known to carry on the tillage of the soil with the same methods and implements that were in vogue a thousand years ago, when perhaps the farmer had the advantage of cultivating richer soils. In France also agriculture had remained comparatively stationary for centuries.¹

In view of the above, the Industrial Revolution alone cannot justify a belief in the future continuity of such rapid wholesale changes in the methods of production. Those who rely on such a belief for a refutation of the Malthusian argument, must first prove their case either by arguing from the historical past, or by pointing to a causal law which will ensure such a progress at least for a very long time to come, if not for ever. And even with regard to the Industrial Revolution itself, it may be questioned whether it was a sudden intellectual or other kind of growth that brought it into existence. On the other hand, as will be seen later, the factors making for its development, had been gradually gathering force for centuries. It was only

¹ In this connection it should be noted that even the belief that man is materially progressive, is of quite recent origin. As Keynes puts it "A belief in the material progress of man is not old. During the greater part of history such a belief was neither compatible with experience, nor encouraged by religion. It is doubtful whether, taking one century with another, there was much variation in the lot of the unskilled labourer at the centres of civilization in the two thousand years from the Greece of Solomon to the England of Charles II or the France of Louis XIV. Paganism placed the Golden Age behind us; Christianity raised heaven above us; and any one, before the middle of the eighteenth century,.....who had expected the progressive improvement in material welfare, would have been really thought very eccentric". *Reconstruction in Europe*, Section Six. Edited by J.M. Keynes.

a landmark in the slow type of evolutionary progress made by man. The fact of the industrial progress of the last century, therefore, does not in the least foreshadow a rapid repetition of it at very short intervals, which is required to keep in abeyance for ever the operation of the Malthusian Principle.

Recent Tendencies and the return to Malthus

In this connection, it should be pointed out that recent events are consolidating the position of Malthus rather than compromising it. The vain hopes of a few buoyant optimists that the advantages accruing to the Industrial Revolution will continue for ever, have been falsified, especially since the conclusion of the Great War, and 'diminishing returns' are once more propping up their ugly head. Economists and industrialists alike, have become apprehensive of this tendency and prospects of a gloomy future have already begun to occupy their minds. Thus the writer of a book published in 1915 tells us that

"the conditions which made possible the unprecedented expansion of the European peoples in the last fifty years are passing away. The agricultural development which came as a result of rapid transportation, the invention of labour-saving farm machinery, and the abundance of new and fertile land cannot be duplicated. The system of transportation can be greatly improved but no revolution such as came with the development of the steam engine seems likely to take place again. The efficiency of agricultural implements will probably be greatly increased, but they have already reached the limit of practicability for extensive farming, not because the improvement might not be improved upon, but because the days of extensive farming are rapidly passing as the new countries become more thickly settled. Fertile land is no longer to be had for the asking in the United States, and will soon be taken in other places where population can thrive".¹

Even the scientific mind of Mr. J. M. Keynes thinks that

“ the danger confronting us, therefore, is the rapid depression of the standard of life of European population to a point which will mean actual starvation for some, a point already reached in Russia and approximately reached in Austria”.¹

What is said above completely reveals the fallacious nature of the argument of the critics of Malthus, who, relying on the industrial progress of the last century, affirm that ‘Increasing Returns’ is a law of Nature and therefore think that Malthus has been sufficiently falsified. We have already pointed out that a mere increase in population is not opposed to the Malthusian Principle ; and that even if it be granted that the increase was such as to negative the Malthusian Principle, the progress in production which made it possible has now spent its force. The tendency to increasing returns was, therefore, only a temporary one, and population must press on the means of subsistence, unless its growth is curbed by one or more of the various checks mentioned by Malthus.

The Validity of the Generalisation that the Industrial Revolution refuted Malthus at least temporarily

We shall now consider an argument which is generally accepted, and allowed to go unchallenged even by those who think that Malthus’s position is essentially correct. In trying to answer the critics of Malthus who deny the existence of his Law by referring to the change that came over Europe in the last century, we concentrated our sole attention on the temporary nature of the change, and thus tacitly accepted the contention that the Industrial Revolu-

¹ The Economic Consequences of the Peace.

tion did deny the truth of the Malthusian Principle, even if it be for some time. This concession to the progress of subsistence in recent times has been made even by the warmest admirers of Malthus. They argue apologetically that it was not Malthus's fault that he could not foresee future developments, and that Malthus's argument can be accepted in a greatly modified form. We do not think that this attitude is correct. The process of industrial development, with all its accompaniments of the rapid growth of population and the steady rise in the standard of living has never brought about even a temporary suspension of the Principle. The notion that it has done this, is an incorrect one and has gained much currency simply from a misunderstanding of the Malthusian Law.

The first fallacy in the argument of a temporary suspension of the Malthusian law lies in magnifying a tendency which might at the most have been true with regard to particular countries, into one of universal application. Writer after writer has argued that because a Germany or an England showed a rapid growth of population with an equally rapid increase of comforts, the theory of Malthus has been given a burial not with respect to these countries alone, but with respect to the whole world. They have ignored the fact that the rapid increase was due not only to an increase in skill, but also because that skill was monopolised by the above-named countries. What would have happened if the new methods had been simultaneously adopted by all countries or at least a large number of countries? Would Germany or England have been able to expand in the way that it did? Instead of the rapid expansion that was witnessed in a few countries, which led astray many a people into the strange idea that Malthus was wrong, there would have been at the most a very slow growth of population all over the world. These countries could afford to develop

their population rapidly only because they had extensive resources in the form of world-markets. If other countries had simultaneously entered on an era of industrial development, their competition, by narrowing down the extent of markets available for German and English industries, would have seriously curtailed the rapid increase in population in Germany and England.

If population in Germany and England progressed rapidly, France was forced to be content with a slow rate of increase. Here the adaptation of new methods was slow, and in consequence the population in France increased from 26·2 to 38·2 millions during the last century. The increase could not be faster because the means of subsistence could not increase rapidly enough. Therefore, even if we grant that Malthus's law was for a time suspended in England and Germany, we have clear evidence of his views being confirmed in France, and this is true of many other countries.

Besides, when we remember the immense cost to other peoples by which the progress of German and English population was brought about, it will be seriously doubted whether it can be taken as an indication of the denial of the Malthusian theory. The rapid expansion of England and Germany alike was based on the economic exploitation of peoples of other nations, the colonies and the dependencies. This exploitation was made possible because political power was used to ensure economic gain. The results of course were the most disastrous to the welfare of the countries thus exploited. Problems of poverty and misery have been created in such countries, and the Malthusian Principle with its inevitable checks of famine or disease has been ushered into existence, perhaps earlier than what would have been the case if the Industrial Revolution, supported as it was by strong political power, had afforded no opportunity for exploitation.

It will now be clear from the above, that by no stretch

of imagination can it be conceived that the Industrial era has falsified the Malthusian theory throughout the wide extent of the world. It can at the most be said to have done this in a small set of countries. And even then the increase in human efficiency alone, as evidenced by the Industrial Revolution, could not accomplish it without a strong political support and without the advantage of having the monopoly of such efficiency. In other words what was gained in one part of the world by raising the standard of life of an increasing population, was lost in another part of it by creating misery and poverty for millions of people. If Malthus was denied with any degree of firmness in one part of the world, he was affirmed with still greater firmness in another part of it, and this too, by one and the same phenomenon, namely, the Industrial Revolution in Europe.

The Malthusian Principle and Nineteenth Century England and Germany

We now turn to the query whether even the enormous increase in German or English population can be taken to be a sufficient refutation of the Malthusian argument. As we have pointed out, a mere increase of population does not in the least affect the position of Malthus, unless it is shown that the increase has been at the rate given by Malthus and still has failed to overtake subsistence; in short unless it is demonstrated that population had been growing unchecked during the progress of the Industrial Revolution, but still the increase in the subsistence available was too great to be outrun by it. The only other alternative is, as we have seen, to challenge the rate of increase given by Malthus for an unchecked population, to find out a new rate, and to show that population had been increasing at this rate without pressing on the means of subsistence. Anyhow it must be shown that population

was growing unchecked when the Revolution in the method of production was going on.

Granting the above argument, what has happened during the last centuries to justify one to conclude that Malthus was denied? Did population in either Germany or England increase as fast as Malthus thought it would if unchecked? The figures given for the growth of population in Germany and England for the hundred years between 1801-1901 show that this was far from being the case. For whereas Malthus thought that population could double itself within so short a period as 25 years, the population of England increased from 16·3 millions to 41·5 millions only within 100 years, while that of Germany increased from 25 to 56·4 millions. This is a rate far below that supposed by Malthus. In view of this how can it be suggested that the Malthusian Law was even temporarily suspended by an enormous growth in human efficiency? The very fact that population could not increase at its full potential rate, points to the operation of various checks to it laid down by Malthus. And it must be remembered that the Malthusian rate of human increase has not been seriously challenged by any of his critics.

But even if it is granted for the sake of argument that Malthus unduly exaggerated the rapidity of human increase, still the growth in population that occurred in the two countries cannot be taken as compromising the Malthusian position in the least, unless, as we have pointed out, it is shown that that growth was of an unchecked population. For, the main point of Malthus is this that an unchecked population tends to outrun production. And is there any scrap of evidence to indicate that population was actually increasing without any checks to its growth? On the other hand, every piece of available information clearly shows that even in this boasted period checks to population had been in operation. The early

years of the Industrial Revolution in England were accompanied by great misery and consequently a high death-rate, because the people could not adjust themselves easily to the new conditions. The growing concentration in towns, the insanitary housing, the horrible conditions inside the factories where children were literally driven to premature graves, the overwork to which adult workers were subjected, all these by causing a heavy mortality constituted a definite check to the growing population.

But it may be argued that this might have been true only at the beginning of the new age, and that with the progress of the new era which made possible a higher standard of life, these checks to population must have disappeared as is clearly shown by the progressive decline in the death-rate. Far from this being the case, the checks to the increase of population in England were somewhat intensified, or at least made more certain in their operation than formerly, when the Industrial Revolution had progressed for full seventy years. By about 1870 began the great fall in the English birth-rate, brought about by an intelligent humanity which wanted to anticipate Nature in her adjustment of population to subsistence, and thus avoid much suffering that necessarily falls to the lot of man when controlled by Providence alone. This deliberate restriction of births checked the growth of population considerably, and allowed a happy adjustment between population and food-supply to be brought about. True, during the earlier years the compensatory fall in the death-rate made it possible for population to increase more rapidly than formerly, but this was a temporary tendency, and every year the decline in the birth-rate gained on the death-rate and effectively brought down the rate of increase, as can be seen from the following table :

*Average rate of increase in Population in
England and Wales per 1000.*

PERIOD	Births	Deaths	Rate of Increase
1881-85	33·5	19·4	14·1
1901-05	28·2	16·1	12·1
1905-09	25·8	14·6	11·2

In face of this how can it be suggested that Malthus was disproved by the progress of population in the United Kingdom? On the contrary, we find here a definite confirmation; inasmuch as the growth of population has been effectively checked so that it should not press on the means of subsistence. Besides, it must be remembered that the check to population was now somewhat intensified, because this new type of check operated with greater certainty, since its application was in the hands of man, and not left to the caprice of Nature. Thus not only has the Malthusian law not been disproved during the 19th century, but the Principle seems to have been in force with somewhat greater rigidity than before. The only difference between the period that preceded the last century and that which followed it, was that while in the former period the checks to population were more obvious and somewhat uncertain in their operation, and caused greater misery, the check in the latter period was more certain in its operation, and avoided much unnecessary suffering inasmuch as it tried to prevent the evil rather than cure it.

One shudders to think what would have happened if the English people had not shown the foresight that they did show in administering the necessary check. The growth of well-being and the fall in the death-rate which attended the course of the Industrial Revolution would

perhaps never have occurred. Population would have tended to multiply beyond the means of subsistence, and this by causing a sharp rise in the death-rate would have brought into existence the checks of Malthus in another form. Nothing but woe and misery would have come out of this, and the Industrial prosperity of England might have been threatened.

The same is true of Germany. Though the increase in population was at one period very rapid in Germany, the birth-rate soon began to decline and slow down the rate of growth; and this check was due to the people's own will.

In this connection it is interesting to note that in spite of the continuous growth of wealth since the beginning of the Industrial Revolution, and of the fact that there were great handicaps, such as artificial control of births, postponement of marriage etc., the population still increased. European nations could not avoid waging war on one another in 1914. The economic and commercial rivalry which among other things led to the war is the same thing as a struggle for acquiring or keeping sufficient resources for an expanding population. This gives additional strength to the observation we have already made, that if all the countries had developed their industries simultaneously, the growth of population would not have been rapid in any part of the world. Instead of this, economic jealousies and commercial wars would have come into existence, and destroyed capital and checked population.

✓ Social Objection to the Malthusian Principle ✓

The socialists attack Malthus because they think that he wanted to exonerate the rich from being responsible for the poor man's misery. Their attack is all the more severe since Malthus thought that human institu-

tions, however benevolently devised, will not be able to make the Principle inoperative. According to them, the Malthusian theory, defending the rights of private property and making the misery of the poor classes depend on their own rapid multiplication, is nothing but a vicious attempt at the justification of the present form of society with all its gross injustice and oppression. This view was emphasised by Prince Kropotkin when he wrote that, "few books have exercised so pernicious an influence on the general development of economic thought as Malthus's "Essay on the Principle of Population" exercised for three consecutive generations. It appeared at the right time.....and it summed up ideas already current in the minds of the wealth-possessing minority. It was precisely when the ideas of equality and liberty, awakened by the French and American Revolutions, were still permeating the minds of the poor, while the richer classes had become tired of their amateur excursions into the same domain, that Malthus came to assert in reply to Godwin, that no equality was possible; that the property of the many is not due to institutions, but is a natural law. Population, he wrote, grows too rapidly and the newcomers find no room at the feast of Nature; and that Law cannot be altered by any change of institutions. He thus gave to the rich a kind of scientific argument against the ideas of equality...."

This is due to a gross misreading of Malthus, who was perhaps as humane in his outlook as the socialist writers themselves. When he argued that "though human institutions appear to be, and indeed often are, the obvious and distinctive cause of much mischief to Society, they are in reality light and superficial in comparison with those deep seated causes of evil, which result from the laws of Nature and the passions of mankind", his only point was to show that the Principle was universally applicable, and would operate even in a socialistic society as surely as Newton's law of gravitation.

The only relevant answer of the socialists to the argument of Malthus will, therefore, be not to criticise him for defending the present structure of society, which he never

did, but to demonstrate that under a wisely devised form of socialistic society, means of subsistence would always outrun Population increasing in a geometrical ratio. Prince Kropotkin, great as he was, has tried to refute the Malthusian fallacy of over-population, as he calls it, in the same manner. He says that the belief of Malthus and of the later economists that a population doubling every thirty years would be confronted by a lack of the necessities of life, is unfounded especially in view of the recent developments in agriculture. If the communistic organization of society were to be brought into existence, then there is no limit to the yield that can be got from the soil, and what is more important this yield will be obtained with greater facility. According to him agriculture under a communistic organization of society, is as much subject to increasing returns as industry is supposed to be under the present system. To quote him

"we go further. We assent that agriculture is in the same position; the labourer, like the manufacturer, already possesses the means to increase his production, not only fourfold but tenfold, and he will be able to put it into practice as soon as he feels the need of it, as soon as the socialistic organization of work will be established instead of the present capitalistic one.

"The agriculturist has broader ideas to-day—his conceptions are on a far grander scale. He knows that we will be able to feed everybody by giving to the culture of the fields no more time than what each can give with pleasure and joy".¹

Even granting the above argument, to prove which Prince Kropotkin gives certain statistics, we fail to understand how such an argument can be taken as contradicting the truth of the Malthusian Principle. To show that the produce of the earth can be increased tenfold does not by itself detract from the truth of the Malthusian theory, for Malthus himself places no limit to the production that can be raised from the earth. The real question is whether, even under a communistic organization, production will

¹ Conquest of Bread, pp. 252-253.

show a permanent tendency to increase faster than an unchecked population. This question, Kropotkin's argument does not answer. He merely says that the produce can be increased tenfold. But in the meanwhile population may increase twenty times. Who is going to provide for this population? Even if we grant that for some time production may increase faster than population, what reason is there to expect such a tendency to have a permanent lease of life? It can be, therefore, asserted that there is nothing in the Malthusian argument which opposes socialism, nor is there anything in the socialistic organization which makes the Malthusian principle inoperative.

Whether the Malthusian Fear is Remote

We have yet to note another argument, and this time not so much against the Principle of Population, as against the time when that Principle will begin to operate. It is argued that even when the Malthusian theory can be said to be essentially true, it need not oppress us for a very long time to come. Vast tracts of land are lying uncultivated, which if utilized will be able to support a population far greater than the world at present supports. While we have got a reserve supply of this land the bogey of over-population need not frighten us. For every increase in population we have this vast reserve to draw upon. It is only when this source is entirely exhausted that we need think of misery and other positive checks; and the time when this will take place is remote, and every increase in human skill tends to lengthen it still further.

Such a contention is quite absurd; for in the Malthusian conception the pressure of population on the means of subsistence is quite imminent, is a fact of the present, rather than an event of the

distant future. Population always tends to multiply beyond the means of subsistence, whether the world has got two acres or two millions of acres under cultivation. In short, the progress of population is more rapid than the means of subsistence and has always to be kept in check. Therefore, by the time that the world will be bringing uncultivated land under the plough, population will be all the while pressing on the means of subsistence. Malthus himself in answering the above arguments said ".....and it is still more curious that some persons who have allowed the different ratios of increase on which all my principal conclusions are founded, have still asserted that no difficulty or distress could arrive from the Principle of Population, till the production of the earth could not be further increased.....It involves a greater absurdity than the saying that because a farm can by proper management be made to carry an additional stock of four head of cattle every year, that therefore no difficulty or inconvenience would arise if an additional forty were placed in it yearly".

Conclusion

In the foregoing pages we have tried first to explain the position of Malthus with regard to the Principle he stated, and then examined one by one the objections of his critics. We have shown that the arguments of his critics generally arise from a misunderstanding of his doctrine, and are often based on the observation of tendencies which are only temporary. We have tried to show, in this connection, that even the claims of the Industrial Revolution, which represented an enormous increase in human skill, to have disproved the Malthusian hypothesis, are quite hollow. Finally we have shown that whatever be the structure of society, the Principle of Population will be sure to operate. We have also pointed out that now that the orgy of prosperity which attended the events of the

19th century is over, economists are returning to the position of Malthus who is being more and more vindicated day by day.

To conclude in this way is not, however to take a gloomy view of the future of mankind and to suggest that nothing but the Malthusian misery awaits man. Western nations like those of France, Germany and England have clearly shown that if man understands the Malthusian Principle correctly, he can easily avoid much suffering and woe, by himself checking the growth of population by a resort to the new method of controlling births. How effective the operation of this check is, can be easily seen from the fact that as soon as it was applied, not only the miseries of over-population were avoided but a higher standard of life was made possible for a growing population, that is, subsistence was actually allowed to increase faster than population. Curiously enough the only way out of the miseries which are generally borne out of the Principle of Population, seems to be not by denying its existence, but by means of a check which Malthus never approved of on ethical grounds,¹ but which in total disregard of its moral aspects the civilised man of to-day does not mind resorting to. The average European of to-day is thus perhaps more an "Economic Man" than an ethical being if such a distinction be permitted.

¹ "I have never adverted to the check suggested by Condorcet without the most marked disapprobation. Indeed I should always particularly reprobate any artificial and unnatural modes of checking population, both on account of their immorality and their tendency to remove a necessary stimulus to industry" Malthus, p. 512.

CHAPTER II.

CHECKS TO POPULATION IN EUROPE SINCE ANCIENT TIMES

In this chapter it is proposed to trace the evolution of the modern form of preventive check which alone has enabled the western countries of Europe to escape the miseries which the Malthusian Principle otherwise entails. In doing so, an attempt has been made to examine critically the hypothesis that the recent check to population, as evidenced by the declining birth-rate, is due to natural causes.

Even from the earliest times in history, customs and circumstances had been in existence which acted as a great handicap to the increase in numbers. These customs either tended to reduce fertility or increase elimination. The particular form which they assumed may have been different in different times and societies; but their effect was essentially the same. Thus even the ancient city-states of Greece regulated their numbers in their own peculiar way. The practice of exposing deformed children was common to all of them. Besides, abortion and infanticide were freely resorted to. Late marriages and celibacy were by no means rare. In case population increased rapidly the remedy was colonization. Whether these practices by themselves were able to adjust population to the means of subsistence is doubtful. The fact that the remedial measure of colonization had to be adopted in times of peace, suggests that this might not have been the case.

War in these times was perhaps the most important factor in limiting the growth of numbers. Indeed, so great

was the check administered by this cause, that the State had often to interfere with the ordinary customs of celibacy and late marriages, in order to have a sufficiently large population. For instance in Sparta, celibacy was punished by law. Various disabilities were also placed on bachelors, and indignities were suffered by those who continued to remain unmarried even in their old age.¹ In Athens also, similar regulations were made. But they were not enforced strictly in times of peace when, in the absence of the great check of war, population could progress rapidly.²

It is interesting to note in this connection that both Plato and Aristotle, in contemplating their ideal city-state, advised regulation of numbers. Both of them favoured exposure of deformed children and the latter also enjoined abortion.³

Checks to Population among the Romans

The Roman conception of the ideal state being one of world-wide domination, the official policy was one of encouraging the increase of population. But there was a wide divergence between public policy and private inclination. Celibacy and late marriages seem to have prevailed to some extent, to judge from the disabilities that were put on them. Abortion was quite common and infanticide was also practised.

War was still the most important factor in the regulation of numbers. The policy of world-wide expansion aimed at by the Romans, necessitated a constant state of warfare and prevented any rapid increase in population. Indeed, as in the city-states of Greece, the decrease due to this cause was so great that it led to much anxiety among Roman statesmen and officials regarding the perpetuity of the Empire.

¹ Strangeland—Pre-Malthusian Doctrines of Population, p. 19.

² Ibid. p. 21.

³ Population Problems by Reuter, p. 43.

As regards the ancient civilizations then it may be safely concluded that the positive check of war prevented an excess of numbers, and indeed sometimes decreased the population below the desired level.

Checks to Population since the Advance of Christianity up to Modern Times

Preventive Checks: As in ancient times, celibacy and postponement of marriage constituted the preventive checks of this period, but now they operate to a greater extent than formerly ; because Christianity encouraged the former, while the latter was brought about by social customs and sometimes, as in the case of Bavaria, by legal enactments.¹

How the social customs of the pre-modern period restricted the increase of population can be well understood from what follows.

Rural life, as was generally the case before the advent of Industrial Civilization, was very rigid in those times. The number of houses and families in a village was somewhat fixed according to the requirements of the village, that is, according to the number of hands the village required. The number of hands desired was that which was shown by experience to produce the maximum average income. This was a fairly constant number over long periods, since no kaleidoscopic changes in the art of production were witnessed in those times. The result was that "young people found it difficult to establish themselves till some married couple had passed away from the scene, and made a vacancy in their own parish ; for migra-

¹"In Bavaria the regulations of the Government and the Police ordinances of 1616 forbade the marriage of servants, day labourers, and others without property, and the punishment by which those were threatened by the legislation of 1751, who without the permission of the superior authorities, entered into wedlock and were unable to support themselves without begging extended to corporal chastisement or the like".
Rubin J. R. S. S. LXIII.

tion to another parish was seldom thought of by an agricultural labourer under ordinary circumstances.¹

As a consequence, whenever an epidemic or famine removed the obstacle to marriage by taking off married persons in large numbers, there were many waiting to fill the vacant places.

What the rigidity of the country life did for cultivators and other rural people, the guild system of the mediaeval town did for the merchants and craftsmen. Trade and manufacture were monopolised by the guilds within the corporation limits, and a long term of apprenticeship had to be undergone before a stranger could become a member of the guild. Postponement of marriage was thus necessarily brought about, and a check was given to the increase of population.

The Positive Checks of the Period

If the preventive checks were more prevalent in this period than in former times, the positive checks were still more so, though many of them had changed to yield place to newer and greater ones.

Thus infanticide and abortion disappeared from the scene owing to the Christian objection against them. Disease and child mortality, however, occupied a prominent place among the influences retarding the growth of population. The circumstances of this period were especially favourable to the continuous operation of the former. The insanitary habits of the people, the filthy surroundings in which they lived, and the general ignorance of the root causes of disease, made for its progress throughout this period. The havoc worked by the Black Death is too well-known to need any repetition here. It is estimated that nearly a quarter of the inhabitants of Europe perished owing to this great scourge.

¹ Marshall, *Principles of Economics*, p. 186.

War, however, lost its importance as the one limiting factor which held population in check. Warfare was no longer the normal state of affairs, having now become a matter of policy. It was, therefore, not a regular cause of elimination¹ as it was in primitive societies and in ancient Greece and Rome. It was however, still an important factor in checking population and considerably reduced the number of inhabitants on occasions.

The great positive check of famine was first seen to operate in this period. From the point of view of population, it is the most important check, since it is generally due to want of subsistence. The occurrence of famine during this period may be taken to be a sure sign of an overgrowth of population. There is no doubt that famines were often due only to wars, but the fact that they appeared for the first time in this period, may be taken to indicate that by this time greater checks were required to keep population to the limit dictated by subsistence.

Let us at this stage point out the relation that exists between over-population, and preventive and positive checks. The prevalence of preventive checks like postponement of marriage cannot always be taken as an indication of over-population; for such customs are often observed simply because they are handed down by tradition. The same is true with regard to the positive checks like infanticide and abortion. Even war can be scarcely regarded as a fit evidence of an overgrowth of numbers. This is especially true with regard to the mediaeval and modern period of European history; for warfare by this time is dictated by the exigencies of state policy. Of course war can be said, even in modern times, as originating to some extent in the fear of over-population. It is well-known that the recent world war was to a great extent a war for economic supremacy, which is the same thing

¹ Carr Saunders, p. 248.

as a struggle for securing new resources for an expanding population.

But the case of other positive checks like famine and epidemics is quite different. They are born out of a want of subsistence and as such are the clear results of over-population. Moreover, the fact that they are natural checks is very important in this respect ; for nature never interferes before things have reached a crisis. She allows her discipline to be broken with impunity for quite a long period, and then tries to restore order in an unexpected manner. The operation of these natural checks, therefore, is a good indication of over-population.

As regards the mediaeval or pre-modern period, we may therefore conclude that though various customs and manners tended to restrict population within proper bounds, it often multiplied to the lowest limit set by subsistence, with the result that Nature had to step in to restore the balance by means of the disastrous checks of famines and epidemics. This must have caused great misery and hardship to the people, producing a gloomy outlook on life. The extent of this misery must have been intensified by the legal enactments against the marriages of the poor. The population problem of old Europe does not seem to have been solved by the preventive and voluntary checks of late marriages and celibacy, nor by the legal remedies against an undue multiplication of people on the margin. The Malthusian Principle seems to have operated with some degree of virulence in the form of famines and epidemics during this period.

Checks in Modern Times

With the advance of modern times a great change has come over the nature of the checks. Hitherto all important factors in limiting the growth of population acted through the death-rate. In ancient times it was the posi-

tive check of war that retarded the rate of increase. Later, famines and epidemics made a haphazard attempt to adjust numbers to the means of subsistence. These forces tending towards elimination have mostly disappeared from modern European society. In the new economic organization there is no place for famines, and disease has generally been brought under control by the advance of medical science. Wars have not become a matter of history; but their operation is now less frequent than before. Wars are now decided upon not by the whim or caprice of an autocratic ruler, but by the consent of a whole nation. In consequence, the European death-rate had declined appreciably, before 1914.

But if the positive checks have now ceased to operate as in the former times, their place has been taken by the preventive and more effective check of a low birth-rate.

This general decline in the birth-rate of civilized nations is the most striking phenomenon of recent years. Europe has been experiencing this fall for over half a century. During the earlier years the decrease in the birth-rate was compensated for to some extent by a similar decline in the death-rate. But the former distinctly gained over the latter many years ago, with the result that the Western nations are having a slow rate of increase. The effectiveness of the check in preventing population from overtaking the means of subsistence will be discussed later. In the meanwhile we shall try to trace its course in the various countries affected by it.

The Course of the Declining Birth-rate

In England the fall was first experienced after the great impetus given by industrialization to material prosperity was over. The birth-rate reached its maximum in 1876, and thenceforward showed a steady and consistent decline, as is clear from the following table :—

*Table showing the Annual Birth and Death Rates
for England and Wales*

Period.	Average Births per 1000 living.	Average Deaths per 1000 living.
1851-55	33.9	22.7
1856-60	34.4	21.8
1861-65	35.1	22.6
1866-70	35.3	22.4
1871-75	35.5	22.0
1876-80	35.3	20.8
1881-85	33.5	19.4
1886-90	31.4	18.9
1891-95	30.5	18.7
1896-00	29.3	17.7
1901-05	28.2	16.0
1906-10	26.3	14.7
1911-15	25.6	14.3
1916	20.9	14.9
1917	17.8	14.4

The tendency of the birth-rate to fall more rapidly than the death-rate is unmistakable from the preceding table.

In France the decline began much earlier than in any other country. It dates from the beginning of the 19th century as shown below :—

Year.	Average Birth-rate per 1000.
1811-20	31.8
1841-50	27.4
1871-80	25.4
1881-90	23.9
1891-1900	22.2

Since the eighties of the last century almost all European countries have experienced the fall. In Denmark the birth-rate fell from 31.4 in 1871-80 to 30.2 in 1891-1900. In Scotland it fell during the same period from 34.9 to 30.6, in Ireland from 26.5 to 23.0, in Sweden from 30.5 to 27.1, in Austria from 39.0 to 37.1, in Germany from 39.1 to 36.1.

The following table gives the statistics for some of the European countries.

Birth Rate per 1000

Country.	1871-1880.	1881-1890.	1891-1900.	1901-05.
Scotland	34.9	32.3	30.6	29.1
Ireland	26.5	23.4	23.0	23.2
Denmark	31.4	32.0	30.2	29.0
Sweden	30.5	29.1	27.1	26.1
Austria	39.0	37.9	37.1	35.1
Hungary	—	44.0	40.6	37.2
Switzerland	30.8	28.1	28.1	28.1
Germany	39.1	36.8	36.1	34.8
Prussia	39.0	37.4	36.7	34.9
Holland	36.2	34.2	32.5	31.6
Belgium	32.3	30.2	29.0	27.7
France	25.4	23.9	22.2	21.3

It may be added that the fall in the death-rate in these countries has been less rapid than the decrease in the birth-rate.

The Real Cause of the Decline in the Birth-rate

After having noted the course of the birth-rate, the question naturally arises as to the cause of its consistent fall over the last fifty years. Strange hypotheses are put forward from time to time to explain this peculiarity of

modern times. Alternate cycles of low and high birth-rates, physical deterioration, high standard of living and a greater love of pleasure accompanied by a shirking of parental responsibility, the higher education of women—all these figure as possible explanations. These suggested causes of the decrease may be considered by inquiring whether the decline has been due (1) to postponement of marriage (2) to natural causes (3) or to the practice of neo-Malthusian methods.

Relation between the Age at Marriage and the Declining Birth-rate

In considering postponement of marriage as a possible factor affecting the birth-rate, only the female age at marriage is generally taken into account; for the age at which the male population marries is said to have no appreciable effect on the fertility of a people.¹

So far as the former is concerned it is generally admitted that there has been no appreciable change in the mean age of women at marriage to justify the consistent fall of the birth-rate over the last fifty years. On the other hand, it has been found that the age has shown a slight tendency to become lower than to rise, which ought to have been the case had it something to do with the decline. The following table for 1891-1900 will make this clear.

Mean Age at Marriage

Country.	Spinsters.		All women.	
	1891-95.	1896-1900.	1891-95.	1896-1900.
England and Wales	25·0	25·1	26·2	26·2
Sweden	27·0	26·7	27·6	27·2
Finland	26·0	25·8	26·0	25·7
France	23·6	23·5	25·4	25·2
Prussia	—	—	26·5	26·2

¹ Carr Saunders, p. 89.

It will be seen from the above that, with the exception of England and Wales, in almost all the countries the age at marriage either of spinsters or all women slightly declined between 1891-1900. It is also quite interesting to note that France which had the lowest birth-rate even in those years had also the lowest age of marriage. These facts must be taken as disproving the hypothesis that the recent decline in the birth-rate has been in any measure due to late marriages.

Nor can it be argued that the decline might have been due to a decrease in the proportion of women of child-bearing age or of wives. The following table for England and Wales may be taken as an illustration :—

Number per 1000 of Total Population

Year.	Females aged 15-45.	Wives aged 15-45.
1871	231	115
1881	231	118
1891	238	112
1901	250	117
1911	254	119

We see that the changes have been too slight to affect the birth-rate in any way. Indeed between 1891-1901 and 1901-11 the proportion of wives has increased rather than decreased.

If any doubt still remains as to the effect of these factors on the birth-rate, the following table will entirely dispel it. The table gives the true rate of fertility, or 'the corrected birth-rate,' arrived at after eliminating any likely effect of the changes in the mean age at marriage of men or the number of women who marry.¹

¹ For details of the method of arriving at the correct birth-rate refer to "Decline of human fertility" by Newsholme and T. H. C. Stevenson J. R. S. S. Vol. XLIX, part I, from which the table is taken.

Country	Crude Birth-rate		Corrected Birth-rate		1901 Birth-rate in terms of 1881 birth-rate=100
	1881	1901	1881	1901	
England and Wales	33.9	28.5	34.7	28.4	82
Scotland	33.7	29.5	39.3	33.4	85
France	24.9	22.0	25.1	21.6	86
New South Wales			38.8	26.5	68
Victoria			36.0	27.0	75
New Zealand			36.7	29.6	81
Austria			39.0	28.5	99
Prussia			39.9	35.7	90
German Empire			40.4	35.3	87
Italy			36.9	33.7	91
Belgium			40.8	31.0	76

It will be seen from this table that, even after eliminating the variability of the two factors mentioned, there has been a great decline in the fertility rate. The rate of its decrease however, has been different in different countries. It has been least in Austria where the relative corrected birth-rate of 1909 is 99, as compared with the 1881 corrected birth-rate, which is taken to be 100. But it has been greatest in New South Wales where the figure for the relative corrected birth-rate stands at 68—a decline of 32 per cent. Next in order are Victoria and Belgium with the 1901 figures at 75 and 76 respectively. In all other countries the decline has been less, and varies between 91 in Italy and 81 in New Zealand. Though these figures refer only to 1881 and 1901, they undoubtedly show an unmistakable tendency towards decline in the true fertility rates of these countries.

One more interesting point about these figures is that the crude birth-rates, wherever they are given, show a smaller fall than the corrected birth-rates. For instance, in

England between 1881 and 1901, the crude birth-rate declined only by 16 per cent., but the corrected birth-rate by 18 per cent. For Scotland and France also, the crude birth-rate during the same period declined by 12.5 and 11.3 per cent. respectively, while the corrected birth-rate declined by 15 and 14 per cent. respectively. This conclusively proves that the decline in the birth-rate far from being only an apparent one, owing to variation in the two factors we are examining, is real and absolute, and is somewhat increased rather than decreased if we eliminate the variability of the two factors.

Natural Decline in Fertility as a Cause of the Decreasing Birth-rate

We may now turn to the second hypothesis that the decline in the birth-rate may be due to natural causes. Those who try to explain the movement of the rate in this way generally rely on the Spencerian proposition that cerebral development is inimical to a high rate of generation. They also quote Doubleday in their support, to the effect that a high state of nutrition lessens the fertility of a species.¹ On this basis it is argued that the fall of the birth-rate during recent years is the direct outcome of the growth of well-being during the last century.

The real weakness of such a hypothesis lies in the fact that it cannot adequately explain the consistent and rapid fall of the birth-rate during the last fifty years. Surely, it cannot be argued that every year the material prosperity of the Western countries is increasing so fast that it can fully justify the recent trend of the rate. Even if it is granted that cerebral development and material progress reduce the fertility of a species, it cannot, therefore, be proved satisfactorily that these have grown so rapidly, as to affect the movement of the birth-rate in the way suggested.

¹ Pell—*Law of Births and Deaths*, p. 178.

In this connection, reference is always made by the advocates of the above argument to the lower rate of reproduction among the rich, especially to the failure of the English aristocracy to reproduce itself. Now the following figures are given by Whetham for the English nobility.¹

Year	Average births per marriage
1831	7.1
1841-50	6.1
1851-60	
1861-70	4.36
1881-90	3.13

It will be seen that these figures show too rapid a decline to be explained by the suggested theory. Has the condition of the English nobility improved so much as to account for such a swift fall in the average births per marriage?

Again on this hypothesis the richer countries in the civilized group ought to have shown a lower birth-rate. But what is the state of affairs? The following table will make it clear.

Country	Average income per head of some of the civilized countries in 1914 ²	The birth-rate for these countries for 1912 was as follows.
	£	
United States	72	(1915) 25.1
United Kingdom	50	—
England and Wales	—	23.9
Germany	30	28.3
France	28	18.9
Italy	23	32.4
Austria Hungary	21	—
Spain	11	31.6
Australia	54	28.7
Canada	50	—

¹ Family and the Nation, p. 139.

² The figures are those given by Stevens in J.R.S.S. Vol. XXXII, p. 491.

France has not the highest income and yet she has the lowest birth-rate. America has the highest average income per head, yet she possesses a birth-rate greater than that of England and Wales. Australia also has a larger income than France, England and Germany. Her income is about one and a half times that of France, and her birth-rate is also one and a half times the French birth-rate. The average per capita income of Australia is greater by £4 than the English income, and yet the Australian birth-rate is nearly 12 per cent. higher than that of England and Wales. So also in the case of Germany, in spite of the German income being considerably lower than the Australian one, the Australian birth-rate is slightly higher than the German rate. On the suggested theory, the United States ought to have had the lowest birth-rate, instead of France which ought to have occupied a different position. Australia should have had the second lowest birth-rate and Spain ought to have shown the highest figure.

Again if the theory were true, why should have the decline begun first in France, where there had been no industrial revolution with its accompaniment of a rapid growth of well-being? The fact that it began first in France where population had been pressing on the means of subsistence, rather than in England where it ought to have been according to the theory, points to the only other explanation left for us.

We refer to the use of contraceptives as the real cause of the fall of the birth-rate, and in support of this theory we have ample evidence.

The fact that the decline first began in France is very important in this respect; for there the conditions of life were not quite easy, and the struggle for existence was getting keener and keener. France had no Industrial Revolution of the English type, and any rapid increase in population could not but have multiplied the agricultural

population which had already grown excessive. Under such circumstances what should the French peasant do but limit his family by means of what are known as neo-Malthusian methods?

The fact that the decline in birth-rate began about 1876 in England also points to the same conclusion. There was a vast expansion of trade prior to 1870. During this period means of satisfying human wants were increasing very rapidly. This was accompanied by a high marriage rate during 1850-70.¹ After 1870 the impetus given to trade began to wane. Means of satisfying the enhanced standard of life could not increase so rapidly as in former days. At the same time a new factor appeared on the scene, namely, the intelligence of the people. People wanted to maintain their standard of comfort at all costs. They began to realise that large families were inconsistent with the standard of comfort to which they were hitherto accustomed. They were thus naturally driven to the methods of limiting families which were freely preached by the neo-Malthusians after the Bradlaugh-Besant trial. Thus the decline of 1876 had its root in the economic conditions of the time, and the growing intelligence of the people; it was an expression of the will and the effort of the people to maintain their own standard and to stick to the position they had hitherto enjoyed. It was not solely a physiological phenomenon as Mr. Pell suggests, but it was a deliberate move of an advanced humanity to escape the horrors of a low standard of life.²

¹ According to Hooker "the (marriage) rate during 1850-70 had been maintained at an unduly high level followed by a period during which it was unduly low." J. R. S. S.

² "There seems in our time to be a fixed tendency towards a diminution in the fertility of the marriage which may be supposed to have some connection with increased incomes of the working class population, which render possible an earliest assumption of the responsibilities of matrimony than of old, but at the same time arouses in the new middle class notions which exercise a restraining influence on the fertility of marriage. In the true middle class in any case, these notions are unquestionably much more powerful than formerly." Havelock Ellis, *The Task of Hygiene*.

Another piece of evidence in support of our theory is the attitude of modern western women towards maternity. They have already begun to claim that no child should be born to them without their consent. They are no longer led by the slogan of women's supreme duty towards the State, and day by day they are becoming more vociferous in their demand for the enjoyment of a freer and fuller life which is inconsistent with a numerous brood of children.¹

It is therefore easy to see that the declining birth-rate of Europe is due to the preventive check of artificial birth-control, applied by an advanced type of humanity to escape the Malthusian misery, which awaits a population growing unchecked.

The Efficacy of the Check

The efficacy of this check in preventing population from multiplying to the lowest limit set by subsistence, can be easily seen from the fact that in all countries where it has been in operation, the standard of living has been steadily rising for many years. It cannot be argued that this rise has been due to an increase in human skill only for, as has been pointed out in the first chapter, the European nations could not have been benefited at all by their increased efficiency, had they not regulated their numbers at the same time. The application of this check, therefore, has not only checked the tendency of population to outgrow production, but by restricting the numbers far

¹ "Apart, however, from the present laws and customs affecting women, and apart from the hazardous cruelty of bringing numerous lives into the world—the fundamental question arises whether maternity can never be a duty towards any outside entity state, individual or deity. I deny that it can." And again, "A political system which denies women alike equality of opportunity and adequate social protection; an economic system which is waste incarnate; and sexual institutions founded on the needs and preferences of a primitive type of man alone—these can have no moral claim on women's bodies as instruments of propagation". F. W. Stella Browne—*Population and Birth Control*, pp. 250 and 252.

above the lowest point permitted by subsistence, has actually allowed production to increase faster than population.

The difference between modern and pre-modern Europe in this respect is thus quite obvious. The growth in the population of old Europe was not sufficiently controlled by the preventive checks of late marriages and celibacy, with the result that the positive checks of famines and epidemics were often called into existence. Besides, the fact that these scourges ravaged the old countries too often points to a condition of chronic over-population in them. The real tragedy of these natural restrictions lies in the fact that, by themselves they are never able to arrest the growth of population above the lowest limit compatible with human existence, however miserable that condition may be. They only try to prevent its increase beyond this point. Thus they afford no solution of the population problem; they perpetuate the evils arising out of over-population. The modern form of preventive check, on the other hand, has been tried with a great measure of success and has slowed down the rate of human increase to such an extent as to allow production to go ahead.

It must be remembered that this check, which alone furnishes an escape out of the Malthusian misery, has been voluntarily adopted by the people. No social customs or legal enactments have forced it on the modern European; nor is it due to any religious fervour on the part of the people. It is essentially born out of economic considerations, and has been resorted to in spite of a good deal of opposition from various quarters. It is an expression of the will of the people to live as decent human beings, and as such is very important in connection with the Malthusian theory. Malthus himself could not foresee the part which economic considerations were to play in adjusting population to the means of subsistence.

CHAPTER III.

CHECKS TO POPULATION IN PRE-BRITISH AND ANCIENT INDIA

We now turn to a consideration of the checks to population observable in ancient India. Without going into details, it should be sufficient, we think, to state that the ancient Hindu puranas definitely discountenanced the practice of abortion and infanticide.¹ The practice of Sati, which may be considered a check, also seems to have been unknown in vedic times, as also the prejudice against widow remarriage² which is of a later origin. In the earlier centuries of the Christian era, probably till the 8th century, widow-remarriage was to be found among the higher classes. It was only in the 11th century that it became obsolete. But even then how far it constituted a check to population cannot be determined; because the prohibition refers only to the remarriages of widows among the higher classes. Among the lower classes widow-remarriages were generally allowed.

It is probable, however, that in Vedic times the late marriage of women might have acted as a brake on the growth of population. Women not only married comparatively late but they were also given considerable free-

¹ Bhau Daji in his essay on Infanticide quotes, from many Puranas, extracts denouncing the practice of Infanticide. Compare also the following from Padma Purana "He who...and commits infanticide falls into the great hell called Tamisra". Also the following from Varaha Purana—"The man who destroys infants, brahmins and cows has transgressed all law and is condemned to dark hells, as long as the fourteen Indras exist".

² There is sufficient evidence to show that widow marriage was allowed, and that the rite of Sati was unknown in the Rigvedic period. "Rise up woman"—so runs a text of the Rigveda—"thou art lying by one whose life is gone, come to the world of the living, away from thy husband, and become the wife of him who holds thy hand, and is willing to marry thee" P. N. Bose, Hindu Civilization during British Rule, Vol. II, p. 36.

dom. They shared in the intellectual progress of society and are known to have taken part in philosophical discussions.¹ A natural result of this freedom accompanied, as it was, by late marriages, might have been to reduce the birth-rate.

When we come to later times, however, the whole situation is changed. Women no longer married late, nor did they enjoy the freedom which had been formerly given to them. Attempts were made to put women under restraints to which they had been utter strangers. "In childhood", says Manu "a female must be subject to her father; in youth to her husband, when her lord is dead to her sons; a woman must never be independent". Early marriages were now encouraged and enjoined. The marriageable age of girls is declared in Manu Sanhita to be twelve or even eight. It is probable that pre-puberty marriages were not very common, and that no social obloquy was attached to marriages which took place within three years after puberty. This is borne out by the statement in Manu-sanhita that "a girl having reached the age of puberty, should wait three years, but at the end of that time, she should herself choose a suitable husband". It seems, how-

¹ Hindu Civilization during British Rule Vol. I, p. xxxix. The author says that this freedom was accompanied by a laxity in sexual morals unknown in later times.

This might be taken as indicating that in Vedic times there was postponement of marriage to a great extent, for it has been found "that late marriages favour illegitimacy" vide Rubin J. R. S. S.

He gives the following figures on which he has based his conclusion.

	No. of married mothers under 25 per 1000	No. of unmarried mothers per 1000
Denmark	163	104
Copenhagen	179	264
Western and Mid Jutland	148	48
Frenen	145	109
East Jutland	158	91
Bornholm	171	89
Lolland and Falster	172	88
Zealand	183	24

He concludes "the more married women under 25 the fewer the mothers of bastards".

ever, that in Yajñvalkyā's times early marriage was an established custom; for according to Yajñvalkyā the guardian of a girl, who is not given in marriage when she reaches the age of puberty, is guilty of causing miscarriage. We have, however, little evidence to show the age at which early marriages were celebrated, and to what extent the laws laid down by Yajñvalkyā and others were obeyed. Perhaps the very stringent terms in which these laws were expressed indicate that the people as a whole were not disposed to listen to them. All that we can say is that compared with the Vedic period, the average age of marriage for women was now lowered, and that women were no longer given the freedom enjoyed by them in former times. It is possible, therefore, that in this period instead of a check to population, a special stimulus may have been given to its increase by the custom of child marriage, and the curtailment of the sphere of woman's activities. We do not know whether there were any positive checks like famine or war in ancient India. Probably there were occasional failures of rain, to guard against which irrigation was resorted to.¹

During the mediaeval period war must have operated as a check; for this period was characterised by the incessant warfare due to Mahomedan invasions. The deaths directly caused by war may not have been so numerous as to give a considerable check to population,²

¹ "It is interesting to note that as early as the vedic period the Aryans knew full well the treachery of the rains and consequently did not merely depend upon the mercy of the heavens but resorted to artificial methods of reinforcing the operation of natural agencies" M. A. Buch. *Economic life in Ancient India*, p. 56.

² The estimates of deaths directly due to some of the wars such as those of Tamerlane, if true, tell a very grim tale and clearly indicate the sanguinary nature of the warfare of those times. Such wars, if the estimate of the death list is true, must have given a very great check to population, in as much as in these not only men were slain in large numbers but also women. But probably the estimates may have been exaggerated. Moreover, such calamities were exceptional. The wars of the other Mahomedan conquerors were not based on a policy of wholesale destruction.

but a continuous state of warfare tends to produce an unstable condition of society and hampers production and trade.

When crops are likely to be destroyed or stores of grain likely to be looted by a passing army, the cultivator will think twice before gambling in agriculture. How far the set-back thus given to production acted as a check to the growth of population cannot be ascertained. All that we can say, is that the indirect check thus given by war might have been much more considerable than the direct one ; for it is only among primitive societies when the population is small and warfare is most sanguinary, that the deaths directly due to war are proportionately numerous enough to constitute a check.

In societies with a higher stage of culture, warfare is more or less regulated. It is not based on a policy of root and branch destruction. The deaths caused by warfare are, therefore, in many cases inconsiderable in number. But the indirect check given by war, the numerous deaths due to famine and pestilence which generally accompany warfare, is often great and constitutes the chief check given by war in these advanced societies. In India, as we have seen, it was perhaps the check given to production that may have constituted the chief check to population.

Howsoever small the direct check given by war might be, there is one thing to be noted about it, namely, that it tends to be dysgenic. It is the brave, the more able and the more intelligent that are destroyed in a war, which means that after the war, society is recruited from a larger proportion of the more unfit.

Apart from the check given by war, there existed at least one check even in the best period of Mahommedan rule—the Moghul period. Famines frequently occurred even in those times and sometimes carried off the population in large numbers. Between 1614-15 and 1659-60 there occurred nearly thirteen famines of varying inten-

sity.¹ Many of these, however, were mere scarcities unattended by acute distress. Some of these were confined to smaller areas and may be called local. Others were more wide-spread. It must also be understood that in those days a local scarcity of food often turned into an acute famine, simply for want of means to transport the bumper crops of other places to the affected area.

On the whole, we must say that the check given by famine in those times must have been considerable. The exact list of deaths due to these calamities is not to be found, but a description of the great famine of 1630-31 by Von Twist is well worth quoting :—

“So little rain fell that the seed sown was lost, and no grass grew. Cattle died. In towns and villages, in fields and on roads, men lay dead in great numbers, causing such a stench that it was terrible to use the ways. For want of grass cattle fed on the corpses; men took the carcasses of beasts to eat; some in desperation went about searching for bones which had been gnawed by dogs.. .

“As the famine increased, men abandoned towns and villages and wandered helplessly. It was easy to recognise their condition; eyes sunk deep in the head, lips pale and covered with slime, the skin hard, with the bones showing through, the belly nothing but a pouch hanging down empty, knuckles and knee-caps showing prominently. One would cry and howl for hunger, while another lay stretched on the ground dying in misery; wherever you went you saw nothing but corpses.

“Men deserted their wives and children. Women sold themselves as slaves. Mothers sold their children. Children deserted by their parents sold themselves. Some families took poison and so died together; others threw themselves into the rivers. Mothers and their children went to the river-bank and drowned themselves hand-in-hand, so that the rivers flowed with corpses. Some ate carrion flesh. Others cut up the corpses of men, and drew out the entrails to fill their own bellies; yes, men lying in the street, not yet dead, were cut up by others, and men fed on living men, so that even in the streets, and still on road-journeys, men ran great danger of being murdered and eaten up.”

¹ Moreland—India at the death of Akbar.

This description refers only to Gujarat, though the famine occurred also throughout the central parts of India. How far the distress was acute in the other famine stricken parts we cannot say. Even if the distress had been intense over the whole of Central India, it must be understood that such calamities were rare and generally local. Out of the thirteen famines referred to above, six were more or less acute, and they occurred in such varied areas as the Coromandel Coast (1613-14), Central India (1630), the Southern Section of the Coromandel Coast (1645-46), Rajputana (1647) and the East Coast (1659-60).

From a list of the calamities given in the preceding paragraph, it will be understood that almost all, with the exception of that of 1630-31, were more or less local and became acute owing to a lack of adequate means of transport. Were it not for the conspicuous absence of such means, it may be suggested, that such calamities might never have occurred. Another factor which might have considerably influenced the frequency of famines was the continuous state of warfare in these times. When security of life and property was little, when the resources of the whole nation were utilized to keep the army intact and the army chief in luxury, it was but natural that the great bulk of the population should not have enough stamina to face such serious emergencies.

It may be concluded from the above that generally during the pre-British period population was regulated by the positive checks of famine and war. Preventive checks seem to have existed to some extent in ancient times, but unlike Europe, they gradually disappeared. If religion and custom favoured their operation in Europe, in India the same forces made for their total abolition. As contrasted with Europe, therefore, an attempt to regulate population by a deliberate action on the part of man, was generally absent in this country.

CHAPTER IV.

CHECKS TO POPULATION IN MODERN INDIA

I. FAMINES

From a consideration of the checks in pre-British days, we now come back to the checks that are in operation since the beginning of the British rule.

In the early days of British rule infanticide was practised to a very great extent in some of the states of Kathiawar. But in a general consideration of the checks operating all over the country, such local practices are a negligible quantity, and need not detain us, especially in view of the fact that measures to suppress them were taken very early.

Apart from this, two other checks which are generally found in primitive societies are also found in India. They are pre-puberty intercourse and prolonged lactation. Prolonged lactation has a double effect. To a slight extent it reduces the rate of conceptivity among women, and it is also followed by abstention from intercourse to a greater or smaller degree. A Punjab enquiry suggests that during the earlier years of married life, owing to prolonged lactation, a child is born every three years.¹ The same enquiry shows that for every completed marriage on an average 5.68 children are born of whom 3.99 remain alive. In Bengal it has been found that in the case of families where both parents are alive, 24 children are born to every 100 married couples.

The effect of pre-puberty intercourse is to lower the child-bearing capacity of the party by the injuries and disease which it causes. Though not quite an unknown

¹ Punjab Census Report, 1921, p. 256.

phenomenon, pre-puberty intercourse is not widely practised in India, but co-habitation begins at, or soon after, puberty and is attended by similar results. It tends to check the increase of population partly by reducing the fertility of women, and partly by increasing the death-rate of wives of tender age. For instance, in North Bihar, ¹ where child marriage is most prevalent, the proportion of females to males falls below 850 per 1000. This is attributed to the fact that the age-period of 10 to 15 years, includes girl-wives among whom death works havoc. It has also been found in the Punjab "that the marriages in which the woman is below 15 or above 30 are relatively infertile."² In the Baroda Census Report for 1901, the Superintendent writes that child wives in numbers "march from the nuptial bed to the funeral pyre. Nervous debility, consumption and uterine diseases create havoc among them".

There is one great preventive check in India namely that of enforced widowhood. How far it restricts population cannot be ascertained exactly, but the number of widows as given in the Census Reports indicates that the check may be a considerable one.

The checks, however, which enormously control the growth of Indian population are the positive checks of famines and diseases. Before we turn to these we must first understand the relation between positive checks in general and the population problem of a country.

Positive Checks in Relation to the Population Problem

As we have pointed out in chapter II, positive checks do not solve the population problem of a country; they effect a temporary adjustment; the root of the evil remains, and we find once again that the population has

¹ Census Report, Bihar, 1921, p. 170.

² Punjab Census Report, 1921, p. 253.

increased to the lowest limit set by subsistence. Such a state of affairs once again calls for Nature's remedy, in the form of positive checks of famines or epidemics to restore the balance. We may point out that though famines are primarily due to want of rain, their effect on population is due to a lack of resisting power on the part of large numbers of men, who are generally on the margin of subsistence. Similarly, epidemics take root more easily among those whose vitality is low. The operation of these checks therefore, is a sure indication of the multiplication of population beyond the limit set by minimum subsistence.

From this point of view, the state of affairs in India is very grave. The history of population during the last hundred years or more in this country is mainly the history of the operation of the two great positive checks of Famines and Epidemics. It has more to do with the prevention of the growth, rather than with the growth itself. It may be safely said that during the last century, with the exception of the decade 1881-1891, there was no period which was completely free from these scourges.

Famines and Population

We shall confine ourselves in this chapter to a consideration of Famines as a check, to the growth of population. We shall find that in spite of various efforts and large amounts of expenditure by the Government, the first century of British rule in India was characterised by a series of famines, which were on the whole more frequent in their occurrence, and more extensive in their operation than formerly. In other words, the particular kind of check to population was increasing in its intensity, indicating thereby the tendency of population to increase beyond the means of subsistence, and the consequent tendency of nature to interfere to restore the balance.

Frequency of Famines

That famines are becoming more frequent can be easily seen if we divide the last century into four quarters and examine the number of famines that occurred in each of these. In the first quarter of the 19th century there were five famines. This was a period when the whole of India was a vast theatre of war for parties contending for political supremacy. It can be safely assumed that but for the disorganization caused by war, the effect of these calamities in this period would have been less.

During 1826-1850, by which time British rule had been extended over practically the whole of India, there were only two famines and they were for the most part local. The third quarter of the century, however, saw six famines which included a most disastrous one, known as the Orissa famine.

The record was, however, beaten by the last quarter of the century, which registered no less than 18 famines, four of which were the most terrible that ever raged in India. The abnormal liability of this period to famines is still more emphasised if we compare it with the same period of the preceding century. During 1775 to 1800 there were only three famines whereas in the period under consideration there were as many as eighteen.

Increasing Extensiveness of Famines

Famines have not only been more frequent during the course of the last century, but they have also shown an unmistakable tendency to spread over wider areas. During the first half of the 19th century, the famine widest in extent was that of 1824-25 which spread over Bombay and North Western Provinces. During 1850-1875, however, there were two famines which spread over greater areas than the calamity of 1824-1825. The first was the famine of 1865-66 which affected Orissa, Bihar,

Northern Bengal, and Madras. The second was that of 1868-69 which held in its dangerous clutches such extensive tracts as Rajputana, North-Western Provinces and Bombay.

The record of the last quarter of the century is again unparalleled. It saw some of the most widespread famines among the eighteen calamities it registered. The first was that of 1876-77 which affected Bombay, Hyderabad (Deccan), Madras, North Western Provinces, Oudh and Mysore.

The second which occurred in 1888-89, affected Bihar and the Tributary States of Orissa and Madras.

The third was that of 1891-1892 which affected Madras, the Bombay Deccan, Ajmere Merwara, Bengal and Upper Burma.

The fourth was that of 1895-97, which spread over such extensive areas as Bundelkhand, North-Western Provinces and Oudh, Bengal, Central Provinces, Madras, Bombay, Punjab, Berar and Burma. It was the most widespread of all the famines that had occurred in India during the course of the last century. The most remarkable feature about this famine was that it attacked Berar which had been free from famines for sixty-four years, and which was considered to be outside the famine-zone by the Commission of 1880.

The fifth famine of this period occurred in 1899-1900. This was one of the most extensive famines hitherto known in India. Sir John Elliot, the Government Meteorologist, estimated that the drought of 1899 was "the greatest in extent and in intensity which India had experienced during the last 200 years".¹ The total population affected was 550 lakhs of which 250 lakhs were in British territory and 300 lakhs in Native States. The British

¹ Quoted by Lovat Fraser "India under Curzon and after". The area affected by this famine, however, was somewhat less in extent than that affected by the 1897 calamity.

Provinces within the famine area, which stretched over 4,75,000 miles, were the Bombay Presidency, the Punjab, the Central Provinces and Berar. All the Native States from Kathiawar to Hyderabad, including Baroda, Rajputana and Central India were also famine-stricken. Like its virulent prototype of 1897 this calamity also extended the famine-zone by attacking for the first time the rich province of Gujarat which had been immune from famine for nearly a century. The last two famines of the century thus showed a new tendency to extend to entirely new territories.

We see from the above that the tendency for famines to be more extensive can be marked not only between different periods but also within the same period. Thus in the third quarter of the 19th century the famine of 1868-69 was greater in extent than that of 1865-66.

As regards the last quarter of the century the following figures with regard to areas and population affected will clearly tell their own tale.

Year of famine	Total area affected in sq. miles	Population affected in lakhs
1888-89	3,500	10
1891-92	50,000	70
1896-97	2,25,000	620
1899-1900	1,89,000	290

Increasing Intensity of Famines

Along with the increase in the extent of these calamities their intensity has also grown. The famines of the last century, especially those which occurred in the last thirty years, were extremely severe, and we observe that the severity gradually increases. The following figures for the different periods of the last century will bear this out.

Deaths from Famine

Period	1800-1850	1850-75	1875-1900
No. of Deaths .	50,09,000 ¹	44,85,000 ²	2,87,40,000 ²

No comment is needed on these figures. They clearly show that the check given by famine to population in India has been increasing over the last hundred years. By the middle of the 19th century it had already assumed huge dimensions, but even these were dwarfed into insignificance by the death-rate which characterised the last thirty years of the century.

The figures quoted in the previous table are appalling in the extreme. It seems at first sight inconceivable that more than 237 lakhs of people should have died within a space of 25 years, simply from want of food. What more severe commentary do we require on the disparity between the relative growth of population and production in this country? What greater mal-adjustment can there be between the two sides of the equation of the population problem? And yet the reproof given by Nature is allowed to pass unheeded, and thousands of lives are brought into existence simply to live in a condition of wretched poverty and rank misery.

Even this huge mortality is, however, not a true measure of the increasing distress caused by famines; for every man that died of starvation there were many others who tried to eke out a painful existence on the relief works. The following table gives relevant statistics for some of the famines :—

¹ Estimated on the basis of the figures given by the Commission of 1880.
² The figures are those given by Mr. Digby in his *Prosperous British India*. We find no reason why they should not be accepted where the Famine Commission do not give the 'mortality from famines'.

Year of famine	Population affected in lakhs	Number employed on relief works (daily)	No. in receipt of gratuitous relief.
1888-89	10	64,000	1,10,000
1891-92	70	2,40,000	
1896-97	620	33,00,000 ¹	
1899-1900	280	46,00,000 ²	

It will be easily seen from the above that here also the tendency for each succeeding famine to cause more distress than its predecessors is quite obvious. The Famine Commission of 1901, referring to the famine of 1899 wrote as follows ".....the most distinctive feature of the recent famine from the administrative point of view was the number of persons who came on state relief. These far exceeded the numbers of any previous famine." Compared with the famine of 1896-97 the number in this famine was greater by 61 p.c. in the Central Provinces, 145 p.c. in Berar and 45 p.c. in Bombay. "The Famine Commission of 1880" continues the report "estimated that 15 p.c. of the population was the maximum number likely to be in receipt of relief in the worst months; and that about 7 or 8 p.c. was the average number likely to require relief continuously for the space of a year. The Commission of 1898 pointed out that these proportions had been largely exceeded in certain areas in 1897, but a much greater excess has been recorded over larger areas and for longer periods, in the recent famines particularly in the Central Provinces."

Besides, it should be remembered that even the above figures as regards the population employed on relief works

¹ The number increased from 50,000 in April 1896 to 33,00,000 in April 1897.

² The number increased from 6,88,000 in October 1899 to 46,00,000 in July 1900.

are not a true index of the extent of the misery, for it is well-known that all but the lowest classes are unwilling to accept relief in any form. That, however, does not mean that they are well-off, and do not suffer from the privations entailed by famines in India.¹

Only one conclusion can be drawn from this state of affairs, namely, that the people with a low economic status are gradually increasing. In this respect the findings of the Famine Commission of 1898 are quite interesting. The Report of the Commission says "This section of the Community (meaning thereby agricultural labourers and the artisan classes) lives a hand to mouth existence with a low standard of comfort and abnormally sensitive to inferior harvest and calamities of season", and further it observes that "far from contracting, it seems to be gradually widening especially in the more congested districts".

Standard of Living and Famines

In view of the increasing mortality caused by famines and the rapidly growing number of people resorting to relief works, it is strange that the officials of the Government of India and even the Famine Commission of 1898

¹ In commenting upon Richard Temple's view that the distress caused by the famine of 1876-77 was not great because 10 p.c of the population affected came on relief works the Bombay Gazette remarked "The sole foundation for the eloquent passage seems to be the fact that the proportion of the population who came upon relief works never exceeded ten per cent. or, to be exact 5,28,951. But it seems to us that before Sir Richard Temple could come to this conclusion, which he uses for the purpose of showing that he is right in compelling the ryots to pay their full land-revenue for the whole period of the famine, he was bound to show what the effect of the famine has been upon those classes which did not come upon relief works. He himself acknowledges elsewhere in his minute that the reluctance of all but the lowest classes to accept relief in any shape or form was extraordinary, and it is therefore, taking a very shallow and one-sided view of the case to assume that because nine-tenths of the population did not ask for help, therefore they have not suffered the greatest distress, and even been reduced to starvation by the famine which desolated the country."

Conclusion

We have so far considered the operation of positive checks, chiefly in the form of famines, during the last century, and the main conclusion that we may draw is that the extent and intensity of the check was on the increase, indicating that large masses of people were living on the margin of subsistence, ready to be swept away by the slightest shock. This shows in other words that the maladjustment between production and population was growing during the last century, and it was greatest during the last few years thereof. Before we come to a general conclusion on this point, we must consider the operation of positive checks, during recent years.

CHAPTER V.

CHECKS TO POPULATION IN INDIA—II. EPIDEMICS

In the preceding chapter we have shown that the positive check of Famine is increasing in its virulence, and in discussing the significance of this tendency we have remarked that it indicates a growing disparity between population and the lowest limit set to it by subsistence. The same significance is to be found in the working of the great check of epidemics.

Operating ever since the seventies of the last century, this check has taken a very heavy toll of life, and on the whole it has manifested over all these years the same tendencies which we have found to be characteristic of famines; in other words, epidemics, like famines, are growing in their intensity as well as extensiveness. The epidemics of the seventies and early eighties were generally confined to a single district or at the most to a number of districts. Thus Kala Azar, which worked havoc among the Assamese population, affected only a single sub-division at a particular time. In 1892 it caused great mortality which made the Census Commissioner write that its "track was marked by deserted villages, untilled fields, a land revenue reduced by 30 p.c. and a disheartened population which after 19 years of steady increase, had receded to a figure at which it stood thirty years ago."¹ But this was limited to the single district of Nowgong. Similarly, the Burdwan epidemic of Bengal was more or less local, and did not spread even to the whole Province.

With the appearance of plague in 1896 in Bombay, the

¹ Census of India, 1901.

old order of things, so to say, underwent a complete change. It was the first calamity of its kind, and the first that can be called an all-India epidemic. It extended over such wide areas as the Bombay Presidency, the Punjab and the United Provinces, and continued its ravages for a decade in these areas with a virulence that was quite unknown before.

Wide as the area affected by plague was, it was far less than that covered by the Influenza epidemic of 1918. This epidemic invaded practically the whole of India though it affected the different parts with varying intensity. The parts which escaped with a light mortality were the coast-line, the Eastern Provinces, and Calcutta. It was, however, specially virulent over such extensive areas as the Rajputana and Central India Agencies, the States of the Punjab, Central Provinces, Bihar and Orissa. In Kashmir and Mysore the attack was severe, and in Hyderabad and Baroda it was no less acute. It is considered to be the worst epidemic that ever visited India, and its effects completely dominate the population figures of the Census of 1921. Formerly, as we have seen, epidemics being confined to a restricted area, could only influence the population figures of a single district or at the most of a province; therefore, they had little influence in shaping the all-India figures. The two recent epidemics—the plague and the influenza—have affected the population figures of the whole country.

That the intensity of these calamities has increased with their extensiveness will be clear from the following brief description of the various epidemics that have visited India.

Kala Azar

To begin with the Census period, the first epidemic which attracted much attention in the eighties of the last century, was the Kala Azar of Assam. It was a virulent

form of Malaria and was first observed in the Garo Hills in 1869, when the Garos are "said to have not only abandoned their sick, but to have stupefied them with drink and then set light to the houses in which they were lying in a state of helpless intoxication". By 1883 the disease had spread to the Goalpura sub-division, and the 1891 census showed a decrease of 29,699 persons. In 1888 Kala Azar invaded Kamrup and claimed a toll of 45,062. In 1892 it passed on to the district of Nowgong where its sway was marked by "deserted villages, untilled fields, and a disheartened population which, after 19 years of steady increase—now receded to where it stood nearly 30 years ago".¹ The mortality was 86,147.

To summarise, the disease spread only to the three districts of Goalpura, Kamrup and Nowgong; the mortality in each district within the ten years 1883 to 1892 is given below :—

Goalpura	29,699
Kamrup	45,062
Nowgong	86,147
<i>Total . .</i>	<i>1,60,908²</i>

The Burdwan Fever

The origin of this terrible epidemic and the way it spread to the different districts of Bengal, once attracted much attention. Opinion was divided as to whether the fever was contagious, though all agreed that it was a malarial type of fever. The Census Commissioner of Bengal, for 1881 concluded however 'that the disease was a malarious non-contagious fever ;.....that it was a mala-

¹ All India Census, 1901.

² This, however, is not the true extent of the mortality firstly because the registration of vital statistics was very inaccurate in those days. Secondly because these figures indicate only the decrease caused by the disease i. e. excess of deaths over births and not the total mortality due to it.

rious fever rendered malignant wherever specially evil conditions favoured its development".¹

The fever remained in Burdwan for 12 years from 1869-1881. The deaths for the three years 1871 to 1873 were calculated by the Census Commissioner to be 3,08,515 or 1,00,000 per annum. During these twelve years, the epidemic, it was estimated, carried off not less than seven and a half lakhs of persons. The estimate of the Census Commissioner, however, runs up to ten lakhs.²

But Burdwan was not the only district affected. The fever affected nearly half a dozen other districts. The following table furnishes the intensity of the disease in each of the affected districts.

*Mortality from Burdwan Fever during the 12 years,
1869-1881*

Burdwan	7,00,000	(10,00,000 Census Commis-
Bankura	20,000	sioner's estimate.)
Birbhum	3,50,000	
Midnapore	2,50,000	
Hoogly	6,50,000	
Howrah	50,000	
<i>Total . .</i>	<u>20,20,000</u>	

¹ Bengal Census Report, 1881, p. 61.

² He makes his estimate in the following way. "At the Census of 1872" he writes "the Burdwan district had a population of 550 to the square mile, or 14,83,850 persons in all. In the same year Dr. Elliot estimated that before the epidemic the density of the population was not less than 750 per square mile. If this estimate be correct, then the population in 1863 was 20,22,750, and the decrease during these nine years was 53,89,00. The mortality however was probably greater than this; for if the normal increase of 10 p.c. in nine years be added to the figures of 1863, the population in 1872, but for the epidemic would have been 22,25,025, instead of 14,83,850. The difference viz. 7,41,175 represents the mortality during these nine years, chiefly from fever....." Having calculated the mortality of the nine years from 1863-72 at this figure, he estimates the mortality for the 12 years from 1863-1875 at 10,00,000. Bengal Census Report, 1881, p. 60.

It must be pointed out that these figures are not a true measure of the incidence of the disease. We must take account of the fact that it is generally only a small percentage of the number affected by an epidemic that die of it, leaving a large number who recover, but who have suffered seriously in health and vitality. The registers in the Burdwan district show that in that district alone, during 1869 to 1876, when fever relief operations ceased, 40,73,039 persons were treated in the Government dispensaries for fever. Of course, even this number, big as it seems, may be an underestimate since registration in those times was known to be very faulty, as it is even now.

Plague

This great scourge which first appeared in Bombay in 1896, was more severe in intensity than that caused by the two previous epidemics. Its range extended over a far wider area, and it may be said that a large part of the country was within its dangerous clutches. Appearing first in Bombay, it spread to the Punjab and the United Provinces causing a 'recorded' mortality of about five lakhs by March 1901. Since then, till 1910 it continued to affect these parts now and again. It did not get any foothold in Bengal, Assam, the East Coast and the extreme South of the Peninsula. A brief account of the course and the incidence of the disease in each province is given below.

Plague in the Bombay Presidency

Plague first made its appearance in Bombay and it took a heavy toll in that province. It rapidly spread over practically the whole of the Province; affecting the three chief towns of Sind—Karachi, Hyderabad and Sukkur—the Province of Gujarat, and taking a very heavy toll in

Belgaum, Dharwar and all the Deccan districts with the exception of Khandesh. The incidence of the disease in each particular district cannot be understood from the mortality figures alone, without reference to the population of the district concerned. The following table furnishes the required facts with respect to certain districts :-

District	Population	Mortality from plague between 1896-1901.	Percentage of plague mortality to total population
Bombay City	7,76,006	64,792	8
Ahmedabad	7,95,967	205	·05
Bronch	2,91,763	1,337	·3
Kaira	7,16,332	2,037	·3
Panch Mahals	2,61,020	890	·3
Surat	6,37,017	7,756	1·3
Thana	8,11,433	14,005	1·7
Nagar	8,37,695	4,001	·5
Khandesh	14,27,382	1,031	·007
Nasik	8,16,504	12,984	1·6
Poona	9,95,530	35,135	3·5
Satara	11,46,559	28,985	2·5
Sholapur	7,20,977	6,944	·97
Belgaum	9,93,976	36,454	3·5
Bijapur	7,35,435	4,810	·9
Dharwar	11,13,298	39,680	3·6

The total registered mortality from plague up to 1st March 1901, that is, during the first five years of the epidemic, was more than three lakhs. This was obviously far below the truth, as the machinery of registration was thrown out of gear owing to the serious outbreak of the epidemic. The Plague Commissioners thought that the true death-rate was greater by at least 35 p.c. than the reported one. On this estimate, the mortality from the

disease during these first five years can be safely placed at somewhere between five and six lakhs.

The total recorded mortality from plague in the decade 1901-1911 reached the colossal figure 14,14,000. During some of the years the mortality exceeded 2,00,000. Coming to particular parts, Satara, Belgaum, Dharwar, Kolhapur and the Southern Maratha Jagirs suffered most. The mortality in these parts was as follows :—

District.	Mortality due to Plague.
Satara	1,80,000
Belgaum	1,48,000
Dharwar	1,44,000
Kolhapur and Southern Maratha Jagirs	1,73,000

If we take the error in the recorded mortality into consideration, the total mortality from plague during the decade will be approximately somewhere between 19,08,900 and 28,28,000. To take the lower estimate we shall put the mortality at 19,08,900. Plague continued its ravages even during the last decade, (1911-1920), though with less virulence, it accounted for a recorded mortality of 5,63,897 during the decade. This was nearly half the recorded mortality from the disease during the decade 1901-11. Taking the error in registration at 20 p.c. only during 1911-20, because the epidemic was not of so serious a nature as in the previous decade, the actual mortality from plague may be safely placed at 6,76,674.

As regards the intensity of the epidemic in each year, only twice did the registered mortality exceed 1,00,000 ; during all other years it was considerably below this figure. The following table furnishes the required statistics with regard to the intensity of plague in each year.

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Year.	Registered Deaths from Plague.
1911	1,00,399
1912	28,984
1913	25,288
1914	20,060
1915	43,821
1916	79,507
1917	1,62,874
1918	79,478
1919	9,626
1920	13,857
<i>Total . .</i> 5,63,897	

Plague in the Punjab

Plague first appeared in the Punjab in 1896, but it did not do much damage till 1907. The general recrudescence of plague in that year, however, was of a more virulent type, and resulted in a record mortality of 6,08,685 in one year. In spite of the fact that there were few deaths from cholera and fever in that year, the death-rate rose to the abnormal figure of 62.1 per mille owing to plague. In 1908 plague almost subsided and the death-rate in 1909 fell to 30.9, the lowest figure since 1900. It however revived in 1910, and caused a mortality of 1,35,483. The total mortality from plague since 1896 amounted to 20,25,220 in British territory, and 2,38,867 in the Native States or 22,64,077 in all. Commenting on these figures the Census Commissioner writes "It is possible that the loss may have been still greater. Assuming the above figures to be correct, the epidemic carried off close on 10 p.c. of the population of 1901 in British territory, over 5 p.c. in the Native States and 9 p.c. in the whole province".¹

¹ Punjab Census Report, 1911, p. 41.

The following table shows the intensity of the plague in each of the ten years from 1901-11 in the Punjab.

Year.	Deaths from Plague in British Territory.	Deaths from Plague in Native States.
1901	14,959	18,629
1902	1,71,302	38,210
1903	2,05,462	54,868
1904	3,96,357	12,748
1905	3,34,897	61,231
1906	91,712	9,424
1907	6,08,685	9,409
1908	30,708	34,338
1909	35,655	
1910	1,35,483	
<i>Total</i>	20,25,220	2,38,857

Plague in the United Provinces

Plague created equally great havoc among the residents of the United Provinces. It made an addition of 2.76 per 1000 to the provincial death-rate, and it accounted for 13,15,252 deaths on the whole during 1901-1911. The incidence of the calamity in the different divisions of the province can be gauged from the following table.

Natural Division.	The average yearly death-rate from plague per 1000 of the population for the decade (or rather nine years, the district figures of plagues in 1901, being not available). ¹
Himalaya West	·03
Sub-Himalaya West	2.1
Indo-Gangetic Plain, West	3.7
Indo-Gangetic Plain, Central	3.2
Central India Plateau	·3
East Sutpurus	2.0
Sub-Himalaya East	1.2
Indo-Gangetic Plain East	6.4

¹ U. P. Census Report, 1911, p. 54.

But the true extent of this great scourge can be understood from the following table, which gives population figures for some of the districts ravaged by plague, for 1911 and 1901, and also the percentage of variation between these two census dates.

District	Population.		P. C. of variation according to the Census.	P. C. of variation according to vital statistics. ¹
	1911	1901		
Saharanpur	9,86,359	10,45,230	-5.6	-4.7
Muzzafarnagar	8,08,360	8,77,188	-7.8	-3.5
Muttra	6,56,310	7,63,099	-14.0	-11.8
Agra	10,21,847	10,60,528	-3.6	-0.4
Cawnpore	11,42,286	12,58,868	-9.3	-7.8
Allahabad	14,67,136	14,89,358	-1.6	-0.7
Lucknow	7,64,411	7,93,241	-3.6	-5.3
Unao	9,10,915	9,76,699	-6.7	-2.6
Manipuri	7,97,624	8,29,357	-3.8	-0.3
Etawah	7,60,121	8,06,798	-5.8	

In all these districts, with the exception of Muttra and Agra, plague alone was responsible for this great variation. In these two districts, malaria was also responsible to a great extent in bringing about the decrease in population.

During the last decade, (1911-1920) the total reported mortality from plague in the United Provinces was 11,12,380.

¹ The wide discrepancy between columns 4 and 5 is due according to the Census Commissioner to the fact that at the time of the Census, when the epidemic was still raging, people had left their places for non-affected areas. Perhaps it may be more due to the fact that during the course of an epidemic the reporting agency which is already defective in India, completely breaks down and hence the error in the vital statistics.

Plague in other Provinces

The mortality from plague in the other areas which suffered less severely is summarised below from Census reports :—

Province or state.	1901-1910.	1911-1920.
Madras	68,870	1,05,332
Central India Agency	40,000	
Hyderabad	98,800	
Kashmir	28,529	
Ajmere	7,889	
C. P. and Berar	2,50,000	1,80,160
Bihar and Orissa		4,20,137
Bengal		6,663
<i>Total</i>	4,91,088	7,12,292

Mortality from Plague

We are now in a position to make an approximate estimate of the mortality due to plague during the last quarter of a century (1896-1920).

Years.	All India Recorded Mortality.	Actual estimated Mortality.
1896-1900	5,00,000	7,50,000 (or 10,09,000) ¹
1901-1910	65,00,000 ²	87,75,000 ³
1911-1920	30,22,445	39,29,172 ³
<i>Total</i>	100,22,445	134,54,172

¹ All India Census Report, 1901, p. 84.

² All India Census Report, 1911.

³ Estimate arrived at by taking into consideration the possible error suggested by the Plague Commissioner.

Influenza

Influenza overshadowed the havoc caused by the previous epidemics. Never before in the history of India was there an epidemic so widespread and virulent in character. It carried on its devastating campaign through the length and breadth of the country; the toll of life it took was simply stupefying, but what is still more important is that all this abnormal mortality was caused within a brief span of three or four months. In fact, this was the most short-lived of all the epidemics and yet was far more destructive, both proportionately and absolutely. The mortality it caused within this short period was nearly five times that claimed by the Burdwan fever during 12 years, and it exceeded by nearly twenty lakhs that claimed by plague during the 24 years, 1896-1920. The extent of this epidemic was also greater; it attacked all parts of India simultaneously. The tendency for the positive checks to increase in intensity is thus proved by the unprecedented havoc caused by the epidemic.

The origin of this terrible calamity is somewhat mysterious. It seems that there were two distinct waves of the epidemic, the first of which was not very powerful. The second and the more virulent wave of the epidemic is supposed to have started on its deadly campaign from some place in the Poona district. It then spread from one province to another in a very short time.

It is no use tracing the course of this disease in all its details throughout the whole of India. It is sufficient for us to consider the incidence of the disease in the more important areas.

Influenza in Bombay Presidency

To begin with, Bombay was the province where the disease first made its appearance. Bombay City, Kolaba

and Poona were the first to come under its influence, and they were closely followed by Thana. The incidence of the disease in the whole Presidency, with the exception of Bombay City and also in some of the districts, is given in the table below.

Place	Population in 1911.	Total excess Mortality June 1918 to February 1919.	Ratio per 1000 of the population.
Bombay Presidency (ex- cluding Bombay City)	1,86,24,020	10,06,658	
Ahmedabad (Dist.) .	8,27,337	28,419	34
Broach	3,06,667	15,158	49
Kolaba	5,94,057	27,538	46
Ratnagiri	12,03,602	36,769	31
Ahmednagar	9,43,991	63,552	67
Sholapur	7,68,017	67,556	88
Bijapur	8,62,927	64,853	75
Dharwar	10,25,086	46,653	45
Hyderabad	6,11,110	34,663	57
Upper Sind			
Frontier	2,62,986	14,115	54

Influenza in Madras Presidency

Influenza was not so virulent in Madras as in Bombay. The Sanitary Commissioner in his Report estimated deaths from influenza at 6,00,000 for 1918. This, of course, is a moderate estimate and relates to 1918 only.

The way in which the different natural divisions of the Presidency were affected by the epidemic can be seen from the following table, which gives the average death-rate from fever in the years 1913-17, and compares it with the average 1918 death-rate from fever which includes influenza.

Natural Division.	Average death rate by fever from 1913-17.	Death-rate by fever in 1918.	P. C. of Increase
Madras Presidency . .	7.4	22.4	202.7
Agency	18.5	35.4	91.4
East Coast North . .	12.6	25.7	104.0
Deccan	8.7	50.8	483.9
East Coast Central . .	4.3	19.9	362.8
East Coast South . .	4.6	13.4	191.3
West Coast	7.8	15.9	103.8

It will be readily seen from this table that influenza made a very great addition to the death-rate in all the natural divisions of the Presidency. Except in one division, it raised the fever death-rate by more than 100 p.c. while in two of the divisions, namely, Deccan and East Coast (Central) it accounted for the stupendous percentage increase of 483 and 362 respectively.

It will be noted, however, that in spite of this abnormally high percentage increase, the influenza death-rate per mille in the divisions of Madras is far below that in the Bombay districts. In most of the divisions of the Madras Presidency the fever death-rate in 1918 is far below 40 per mille, while only in one does it exceed the above figure. In Bombay, on the other hand, many of the districts have a rate far above 40 per mille, and for three districts the rates reach the high figures of 67, 88 and 75 per mille respectively. Besides this, the Bombay figures include only deaths from influenza, while the Madras figures include deaths from ordinary fever also. If this consideration were to be taken into account, there would be a still greater contrast between the Bombay and Madras figures.

Influenza in Bengal

According to the Sanitary Commissioner, the total mortality due to influenza in 1918 and 1919 was about 6,00,000. Of these 3,50,000 deaths occurred in 1918, and the remainder in 1919. The incidence of the disease in different districts showed great variations both in 1918 and 1919. This will be obvious from the following table.

District.	Excess death-rate from July 1918 to November 1918 per 1000
Hoogly	11.3
Bankura	10.0
Nadia	7.9
Calcutta	7.4
Murshidabad	5.3
Mymensingh	4.0
Rangpur	3.2
Dinapur	2.7
Malda	1.4
Patna	0.2
Jessore	0.1

The incidence of the disease can also be judged from a comparison between the monthly mortality figures of 1917-18 and those of 1918-19 for the whole of Bengal.

September 1917	81,425	September 1918	1,10,461
October „	1,04,784	October „	1,70,880
November „	1,22,038	November „	2,64,177
December „	1,61,593	December „	3,30,427
January 1918	1,36,572	January 1919	1,98,814
February „	1,01,787	February „	1,47,012
March „	1,00,844	March „	1,60,258
<i>Total</i>	<i>8,09,043</i>	<i>Total</i>	<i>13,82,080</i>

Mortality due to Influenza

The havoc caused by the epidemic throughout the country and the check it administered to the growth of population can be seen from the following table :—

Province.	Estimated deaths in 1918.	Death-rate per mille.
Ajmere-Merwara	29,835	59·5
Assam	1,11,340	18·6
Bengal	3,86,572	8·5
Bihar and Orissa	7,09,976	20·5
Bombay	10,59,497	54·9
Burma	1,37,491	13·9
C. P. and Berar	9,24,949	66·4
Coorg	2,014	11·5
Delhi	23,612	56·6
Madras	6,82,169	16·7
N. W. F. Province	89,035	43·6
Punjab	8,98,947	45·4
United Province	20,34,257	43·4
<i>Total</i>	70,89,694	
Total estimated for 1919	13,30,000	
<i>Total</i>	84,19,694	

This figure refers only to the areas under registration, which contain nearly three-quarters of the population of India. The mortality in areas not under registration, must have been at least in the same proportion as in those under registration. This would give us a total mortality of 120 to 130 lakhs in India. Even this estimate is very conservative ; perhaps the real figure far exceeded the estimated one.¹

¹ 1921 Census Report p. 13 "Even this, however, must be a substantial underestimate since, owing to the complete breakdown of the reporting staff, the registration of vital statistics was in many cases suspended

Conclusion

To summarize, the influenza epidemic was the worst epidemic that ever affected India during recent times, and it gave a greater check to the growth of population than was given by all other epidemics of recent times put together. What is still more amazing is that it caused a mortality far in excess of that caused by any single famine in India. By its side the figures of famine mortality, huge as they are, pale into insignificance. During the last fifty years all famines put together have caused a mortality of 2,88,25,000 but influenza beat all records by causing a record mortality of 1,33,00,000 within a brief space of nine months.

It may be of interest to point out that the incidence of the epidemic, which broke out about the same time in Europe, was smaller in countries which are known to be economically more advanced than India, or in which the people had a greater resisting power. This can be proved if we take account of the "vital index"¹ for several countries during the years when the influenza epidemic was raging. The vital indices for several countries during the period were as under :—

	1918.	1919.
India	37	84
Switzerland	97	131
England and Wales	108	137
Ireland	111	114
Scotland	124	141
Holland	145	183

during the progress of the epidemic in 1918 and when the time came to reconstruct the figures the number of omissions, especially in the case of women must have formed a high proportion".

¹ By "Vital index" is meant the birth/death ratio in the form $100B/D$. Regarding this Professor Raymond Pearl observes "It may fairly be said that there is no better statistical constant which furnishes so adequate a picture as this of the net biological status of a population as a whole at any given moment. If the ratio $100B/D$ is greater than 100, the population is in a growing and in so far healthy condition. If it is less than 100, the population is biologically unhealthy". Cf. Dr Sweeney, "The Natural Increase of Mankind", 1926.

The difference is obvious. In spite of all its virulence, the influenza epidemic did not raise the mortality rate above the birth-rate in European countries. In this connection it must be noted that the rate of natality in these countries is low, and that they were just recovering from the exhausting effects of the war, when the epidemic overtook them. In this country, however, the deaths exceeded the births to such an extent that the birth/death ratio stood at 57 : 100 in 1918 and at 84 : 100 in 1919. There can be no better proof of the low state of economic vitality of the people of this country.

In this and the preceding chapter, we have considered the effects of the positive checks of famines and epidemics in this country since the beginning of the last century or during the period of settled British rule. We have found that famines were more important till the end of the last century, though epidemics were not absent; and that epidemics have assumed dangerous proportions in this century compared with famines. We have also found that, taking a long view of things, each succeeding calamity has been wider in extent and more destructive in effect than the preceding one. We conclude therefore, that this is an indication of the growing maladjustment between production and population.

CHAPTER VI.

CHECKS TO POPULATION IN INDIA IN NORMAL TIMES

The great positive checks to the growth of population that we have considered in the preceding chapters are, by their very nature, abnormal phenomena. In addition to these, there are other checks which operate under quite normal conditions; they operate steadily and silently; none the less they give an effective check. Most prominent among these are cholera and malaria, both of which are endemic.

Cholera

Cholera has been endemic in the country for many years and has often been the cause of abnormal mortality.¹ During the decade 1881-1891 the mean annual number of deaths amounted to 51 lakhs which according to the Census Commissioner indicated an omission of at least one in three. Of these 3,09,000 on an average were due to cholera. If we take the error into consideration then there were 685 lakhs of deaths in the decade from all causes, of which no less than 41 lakhs were due to cholera. The maximum number of deaths from cholera

¹ The 1891 Census Commissioner, referring to the then frequent outbreaks of cholera, wrote "Cholera and Small-pox are the two main causes of abnormal mortality in India, apart from famine and certain special outbreaks of fever.... Not a year passes without cholera in some part or other of the country, and there seems to be no sign of its becoming rarer or less fatal. Whatever may be its origin, its dissemination is no doubt largely due to the immense congregations of pilgrims at certain seasons of the year, especially of the hottest time, to bathe and drink at one of the many sacred rivers or pools of the country, just about the month when water is at its lowest. In spite of all the sanitary precautions adopted, the outbreak is still a matter of chance, and once it happens there is no limit to its local extension".

for any one year was 4,75,600 or allowing for the error, 6,34,100.

The figures of deaths from cholera for the years 1891-1901 are not available ; for the decade 1901-11 the toll taken by this disease amounted to 38 lakhs.

During the decade 1911-1921 the mortality from cholera in the various provinces of India was as follows :—

Province.	No. of deaths from Cholera.
Assam	1,48,946
Bengal	8,39,402
Bihar and Orissa	8,93,303
Bombay	1,92,888
C. P. and Berar	1,87,431
Madras	6,09,286
Punjab	40,728
United Provinces	5,82,810

The figures relating to deaths from cholera may not be very imposing, especially when the all-India figures of mortality from all causes are taken into consideration. We find that the cholera figure forms only a very small percentage of the all-India total. But when we remember that cholera is a preventible disease, and that human energy and foresight can entirely stamp it out of existence, and that in India it is only the utter ignorance and poverty of the masses coupled with consequent insanitary habits, that are responsible for such an unnecessarily heavy mortality, then alone we shall realise the real importance of this check.

Malaria

Malaria is the other great check which is found to operate even in normal times. It is generally endemic

though at times it assumes an epidemic form and rages with far greater virulence than in ordinary times. The annual mortality from this cause cannot be exactly ascertained from vital statistics, for in India, by far the greatest number of deaths are entered under the head of 'fever'. In this country 'fever' is a general term which includes, besides Malaria, many other diseases like phthisis, pneumonia etc. Moreover, as is well known, entries of deaths under different heads are very inaccurate and sometimes deaths from plague and even cholera are entered under this head.¹ However, a rough estimate of deaths from this cause can be made, for it has been found after careful investigations that Malaria accounts for from one-fifth to one-fourth of the total number of deaths returned under the category of fever.²

Before turning to the check given by the disease, it will be better to discuss the general nature of its prevalence and operation. Malaria is generally endemic in large areas of the country, and as already pointed out it often assumes an epidemic form when it rages with great virulence. Such an epidemic broke out in the decade 1901-11 in the irrigated tracts of the Eastern and Central Punjab,

1 "The returns of deaths under different heads are notoriously inaccurate. The reported number of deaths from fever is invariably in excess of the actual number owing to the fact that the Chaukidars who are primarily responsible for their registration, group under this head nearly all the deaths which are not due to the well-known diseases of plague, cholera or small-pox. Even deaths from cholera are often returned as deaths from fever; a year in which there is a cholera epidemic in a district will usually show a large rise in fever mortality because the Chaukidar goes on returning cholera deaths as due to fever until the epidemic is so bad that he is forced to recognise it". Census of Bengal, Bihar and Orissa, 1911. p. 81.

2 By far the largest number of deaths in India are entered under the category of 'fever' and allowing for inaccuracy of diagnosis it has usually been assumed that about 2/3rds of the deaths so recorded may be ascribed to malaria. Recent investigations made in special areas, however, suggest that this proportion has been considerably over-estimated and that Malaria only accounts for from one-fifth to one-fourth of the number of reported fever cases, the remainder being cases of dysentery, pneumonia, phthisis and other diseases. Census of India, 1921, p. 12.

and the Ganges-Jumna Doab in the United Provinces. In the latter named part alone, the reported mortality from 'fevers' reached the colossal figure of 20 lakhs in 1901.¹ In the earlier years of the last decade the Punjab, and the United Provinces again, suffered from epidemic Malaria; and in 1917, mortality from this epidemic was high in almost every province.

Apart from these sudden outbreaks in epidemic form, Malaria is endemic over wide areas of the country, and it is here that death does its work most insidiously. The strongholds of this disease are the parts of the country which fringe the mountain ranges and also parts of Bengal, Assam and Burma. Malaria has become a great scourge especially in Bengal, for like Assam and Burma, the configuration of the soil prevents flood-water from being drained away. So great is the havoc worked by this disease in Bengal, that it has become an important, perhaps the most important factor in determining the growth of population in that province.² In other provinces, of course, it may not be considered so important a factor as in Bengal. But even when the all-India figures

¹ About this epidemic, the United Provinces Census Commissioner wrote in his Report (1911) as follows:—"It stopped agricultural operations, the very old and the very young died from it and it is said that some villages lost half their population. It diminished vitality which had its result in a much diminished birth-rate in 1909. The damage done to the population, directly or indirectly during these 4 months was enormous. The fever mortality during this period was only some 200,000 short of the total mortality from plague during the entire decennium" p. 45.

² "In fine, all the material conditions were favourable to a continued rapid growth of population. The only obstacle was the state of the public health. Plague, it is true, has never gained a footing outside the metropolitan area; and cholera, though there were epidemics in several years, has failed materially to affect the growth of the population. But malaria has long been the special scourge of this province (Bengal). It is not only responsible for a heavy mortality, but it saps the vitality of the survivors and reduces the birth-rate. Except in the neighbourhood of Calcutta, where industrial developments are the most important factor, it may be said that the growth of the population is determined mainly by the varying prevalence of malarial affections" All India Census, 1911, p. 62 para., 100.

are taken into consideration, it assumes an importance, which but for the testimony of recorded statistics, nobody would ever have dreamt to give it. Epidemics strike our imagination in their virulent though brief career. When an epidemic like plague is raging, it is on everybody's mind, and every one stands aghast at the mortality it causes. But this dangerous canker which eats slowly into the very vitals of the country, and stifles the growth of population far more surely than any other disease, passes off unnoticed.

The dangerous nature of the check given by this disease to the growth of population seems to have been realised by few. It is not well known that if the plague kills by thousands,¹ malaria kills by tens of thousands. It can be proved from Census statistics that Malaria has killed more people in the last twenty years, than plague has done during the last 25 years preceding the last census of 1921, and has administered a greater check than any epidemic with the exception of influenza. Awe-struck as we are at the mortality caused by plague or even cholera, we allow malaria to pass off unnoticed, perhaps only because it takes life regularly and surely, and not sporadically as the above named epidemics do. In other words, malaria has become a normal affair in our life. In this connection, the following figures will be of interest.

¹ Referring generally to fever, which of course includes Malaria, the Bengal Census Superintendent for 1911 wrote "Fever is such an important factor in Bengal, Bihar and Orissa whether considered from a statistical, sociological or economic point of view, that a brief description of its distribution is required. Year by year it is silently and relentlessly at work. Plague slays its thousands, but fever its ten thousands. Not only does it diminish the population by death, but it reduces the vitality of the survivors, saps their vigour and fecundity and either interrupts the even tenor or hinders the development of commerce and industry". Bengal Census 1911, p. 69, para. 158.

Province	1901-1911		1911-1921	
	Malaria	Plague	Malaria	Plague
Assam	1,61,762		2,07,932	
Bengal	19,71,221	51,012	20,91,289	6,663
Bihar and Orissa	14,32,196	5,45,450	15,90,788	3,20,137
Bombay	5,16,993	11,11,441	7,25,162	5,63,897
C. P. and Berar	3,99,082	2,22,652	6,90,264	1,80,180
Madras	5,84,152	68,873	7,42,061	1,05,332
Punjab	9,00,752	20,25,220	8,89,951	6,33,876
United Provinces	26,77,171	13,15,252	27,80,391	11,12,380
<i>Total</i>	86,43,329	53,39,900	97,17,838	30,33,445

Total from Plague (1901-1921) 83,62,345

Total from Malaria¹ ,, 1,88,61,167

The total deaths from plague are, however, understated, this being the total number of reported plague deaths from the major provinces only. As we have pointed out in previous pages, the total number of reported deaths in the whole of India from 1896, the first year when plague broke out, to 1921 was 1,00,22,445, while the estimated deaths came to 1,34,54,172. But, as will be seen from the above table, malaria beats even this grand total of estimated deaths from plague by nearly five millions. This is true even when we compare deaths from plague in the whole of India during the twenty-five years preceding 1921, with those from malaria in the major provinces and during twenty years only.

There can be no more gloomy commentary on the state of public health in this country than that revealed by the facts given above. In spite of the great havoc which

¹ The Census Reports do not give deaths from Malaria in a separate column. They are grouped under the general heading of deaths from fever. The above figures are worked out by assuming the proportion of malarial deaths to total fever deaths given by the 1921 Census Commissioner. All-India Census Report, 1921.

malaria causes to human life almost from day to day, we seem to be oblivious of the fact. We take it to be a normal feature of life in India, instead of a serious menace.

Indirect Effects of Malaria

From the point of view of the check which malaria gives to the growth of population, we have to remember that in addition to the mortality directly caused by it, we have to take account of another factor. For every reported death from malaria, there are many more cases of sickness from the disease ; and this sickness which is generally of a lingering type, saps the vitality of those attacked and reduces the birth-rate. The indirect check thus given to population is also important, and cannot be overlooked. To what extent malaria affects the birth-rate in the various provinces in this way cannot be exactly ascertained. Statistics of certain areas which are the home of Malaria, like parts of Bengal and the United Provinces, show that the reduction in the birth-rate in these areas is serious. The same proportion of reduction may not be found in other provinces not affected by the disease to such an extent. None the less, the fact should be taken to represent a tendency which is in operation, and which may assume an alarming proportion if the scourge spreads to other tracts also.

In the following table we have made an attempt to estimate the loss of births on account of Malaria. We have taken the birth-rate of those areas of Bengal which are known to be malarious and compared it with that of the whole of Bengal. We have assumed that the birth-rate in the malarious tracts would have been as high as in Bengal as a whole, but for the effect of malaria. On this basis, we have calculated that the loss of births in Bengal due to malaria in the last two decades amounts to more than a million.

	1901-1911.	1911-1921.
Birth rate in Bengal	37.60	32.8
Birth rate in West Bengal . .	33.48	30.2
Birth rate in Central Bengal .	33.83	30.8
Deficiency in West Bengal . .	4.12	2.6
Deficiency in Central Bengal .	3.77	2.0
Loss in births over previous census in West Bengal . .	3,39,491	2,20,155
Loss in births over previous census in Central Bengal . .	<u>2,91,450</u>	<u>1,88,513</u>
Total loss in births . .	6,30,941	4,08,668
Total check to population by reduction of births in the two decades		10,39,609

This is but an indication of the serious nature of the indirect check given by Malaria, whether epidemic or endemic. To what colossal figure the total will grow, if we take into account the malarial fevers of the last fifty years or any other period, we cannot estimate. All that we can say is that the total will be a huge one. From the point of view of its effect on the growth of population, Malaria thus acts in a twofold manner, directly by taking life and indirectly by reducing the birth-rate. But the worst feature of this check is that it is to a great extent the penalty we pay for our ignorance and poverty.¹ When the preven-

¹This is the opinion of such an eminent authority on Malaria as Dr. Bentley. Speaking at a meeting of the Imperial Malaria Committee, the learned Doctor said "After several different villages had been visited by a house-to-house examination, cases were found in which economic stress acted in direct relation to endemic malaria and frequently the mortality was to be found in one or two houses, so that there might be a village with a total mortality of 20 to 25 p. c. the bulk of which occurred in very few families. In one village visited, where the people were quite fit and well in spite of large spleen indices, inquiries showed that in the most attacked families the father had died in the previous year and the family were reduced to penury. In other cases it was found that wherever there was evidence of severe poverty endemic malaria was intensified"....."In one village where the workers looked

tion of a calamity is outside human energy and skill, then one has only to resign to fate. But when a disease like Malaria, the prevention of which is quite within human control, is allowed to have a free play, then the problem assumes a more dangerous form. It only proves the relation between the low vitality of the people and positive checks to which we have referred in the preceding chapters, thus affording additional proof of the fact that there is a growing maladjustment between production and population in this country.

Conclusion

We have thus seen that in addition to the operation of abnormal positive checks like famines and epidemics, the population of India is subject to a normal positive check in the form of diseases like cholera and malaria; that malaria is the more important of the two and that it acts in a twofold manner, directly by taking life and indirectly by reducing the birth-rate. We have also noted how the existence of this normal check is an additional proof of a state of overpopulation in the country.

well there was a spleen index of 15 p.c. and every case of the enlargement of the spleen was among people in poor circumstances. In another village, although the spleen index was just over 10 p.c., nearly the whole of the children showed enlargement and it was found that the occupants of 38 houses out of 40 were deeply in debt and were paying in kind such an enormous interest, practically 150 p.c., that they were left with little to provide sufficient food. These observations show that economic stress may play an important part in deciding what effect malaria is going to have, whether there is likely to be a heavy mortality from it or not". Proceedings of the Imperial Malaria Committee, pp. 85, 86.

CHAPTER VII.

THE MOVEMENT OF THE BIRTH-RATE IN INDIA

In the preceding chapters we have discussed the relation of positive checks to the death-rate in the country. We occasionally referred to the effect of these checks on the birth-rate. In this chapter, we propose to consider this latter aspect in greater detail.

General Considerations about the Indian Birth-rate

It is a well-known fact that, as compared with European countries, the birth-rate in India is unusually high. It is generally believed that this is due to the universality of marriage among the inhabitants of this country; and the early age at which they marry.

This belief is, however, wrong, because the movement of the birth-rate in India is not determined by the marriage-rate. Had it been so, the birth-rate would have been maintained at a consistently high level for the last fifty years, for, the marriage rate has been generally the same all the while. Instead of this we have violent fluctuations in the former. With a normal year the birth-rate is generally high. But when a scarcity or a prolonged distress occurs, it suddenly drops down only to rise again with the return of better seasons. Indeed, as will be seen from the following pages, the movement of the birth-rate ever since the eighties of the last century, is one long and tedious history of the check administered to it by recurring famines and epidemics. The result is that instead of the orderly movement that obtains in Western countries, in India we get sudden ups and downs produced by such calamities.

The serious import of what is said above will be easily realised. The positive checks have not been content merely with taking lives by crores. They have also prevented many crores from being born. The movement of the birth-rate is a sure sign of the poverty of India, and indicates only a reckless multiplication of the species consequent on a chilled outlook on life. Had it been otherwise ; had the birth-rate of a generation been a sign of the healthy prosperity of this country, Nature need not have stepped in so often to restore the balance, by causing a heavy death-rate as well as by lowering the birth-rate. The fact that it does this so often, points to an immense maladjustment between population and subsistence.

We shall now proceed to give a detailed analysis of the movement of the birth-rate in the presidencies of Madras, Bombay and Bengal. We have selected only these major provinces for this analysis, because the tendencies found in them can be taken as typical of the country as a whole.

The Movement of the Birth-rate in the Presidency of Madras

The movement of the birth-rate in Madras follows the general tendency described above. A normally high birth-rate is arrested in its career by a prolonged distress like that of 1876-79. In the famine years, it drops down to one-half or one-third, or even one-fourth, of its normal level, and either drops still further down or keeps to this low level till the distress is over. With the return of better or more normal conditions, the birth-rate recovers itself and rapidly attains its former level.

The nine years between 1872 and 1881 may be divided into two periods—the first consisting of the four years from 1872 to 1876, which were normal years, and the second consisting of the remaining years which were famine years. As usual the birth-rate in the former period

is high. The age tables¹ reveal that in 1871 the birth-rate was abnormally high, and that this high level was maintained till 1876, when the first signs of scarcity began to appear. Indeed, so high was the birth-rate during these years, that according to the Census Commissioner, the population was increasing a good deal faster than the normal rate. The second period was, however, not a normal one. It saw wide fluctuations of the birth-rate and being a period of famine and distress, the movement was in the downward direction.

The registered birth-rate for the years 1875 and 1876 was 21·3 per mille. The real rate as estimated by Dr. Cornish was, however, 38 per mille. The registered birth-rates ought, therefore, to be raised in this proportion whenever we want to find out the true birth-rate. How violent the fluctuations in the rate were, during this period, can be gathered from the following table which furnishes the registered and real rates for the years 1876 to 1879.

Birth-rate per 1000

	1876	1877	1878	1879
Registered birth-rate. Madras Presidency	21·7	16·4	12·0	16·0
Real birth-rate. Madras Presidency	37·7	29·2	21·4	28·5
Registered birth-rate. Famine Districts	21·7	14·4	8·8	15·0
Real birth-rate. Famine Districts	38·7	25·7	15·2	26·7

The violent nature of the fluctuations will be more apparent if we trace the movement of the birth-rate during these years for some of the famine districts separately. In the district of Nellore the registered birth-rate for the year 1876 was 11·9. The distress began in August 1876, and by the end of the next year, when the

¹ Census Report, 1882.

distress was well-nigh prolonged over a year and a quarter, the rate fell to less than half of what it was in 1876; it was only 5·6. In 1878 it was less than one-third of what it was in 1876, and equal to $\frac{3}{8}$ th of what it was in 1877. In 1879 the birth-rate began to recover and was more than double the rate prevalent in 1878. The following table shows that the tendency for the other districts is the same, with the exception of the town of Madras, which shows a gradual increase in the birth-rate and which is not affected by famines. It may be mentioned that the death-rate in Madras town was also the largest in the Presidency during these years.

Birth-rate per 1000

Famine Districts.	1876	1877	1878	1879
Nellore	11·9	5·6	3·5	7·7
Madras Town	29·5	36·4	39·3	42·1
Chingleput	23·1	13·3	15·0	29·5
South Arcot	21·7	17·8	10·2	17·8
Trichinopoly	29·6	24·1	14·0	21·5
Madura	22·6	15·5	7·4	13·5
Tinnevely	22·1	16·1	13·9	19·7
Karnul	20·1	11·4	3·8	7·1
Cuddapah	17·8	10·8	4·2	10·8
Bellary	24·7	13·4	5·2	8·6
North Arcot	21·6	13·2	7·5	19·8
Salem	25·1	13·0	7·2	6·3
Coimbatore	18·0	12·3	7·1	13·3
Nilgris	13·7	16·8	12·7	13·7
Non-famine Districts.				
Ganjam	27·4	23·4	15·9	17·2
Vizagapatam	17·3	15·1	14·8	10·1
Godavari	20·2	19·3	18·8	15·1
Kistna	18·9	15·3	14·5	15·6
Tanjore	30·2	27·6	24·7	29·8
South Canara	21·9	20·3	17·5	17·2
Malabar	18·0	18·1	14·4	15·0

The recovery from the effects of famine is sometimes slow, sometimes very rapid. As can be seen from the

table, the birth-rate in the district of Chingleput in 1879 was 6·4 more than what it was in 1874. In others, the birth-rate, though recovering, took a long time to attain its normal level. In 1880 and 1881 the birth-rate was yet below normal. The age tables reveal that "in 1881 the enfeebled population was gradually recovering itself and that the birth-rate was generally rising towards its former level".

The extent to which our birth-rate is sensitive to an adverse economic circumstance like famine will be quite clear from the above. Famine, not only lowers the birth-rate in the year in which it occurs, but also keeps it down in the following two or three years. The gravity of this fact will be realised when we remember that this effect is produced by starvation which leads to sterility.

The decade 1881-91 followed a period when the population of the various districts was depleted by famine. Except for the reaction which inevitably followed the temporary check given by famine, the movement of the birth-rate in this decade, which was a normal one in point of material conditions, presents no special feature. The tendency towards a high birth-rate in normal years is all the more emphasised, since the decade followed a period of distress and famine. There are no ups and downs nor violent fluctuations in the year to year birth-rate during this period.

The next decade was not very favourable to a rapid growth of population.¹ The birth-rate was still as high as 44·8, the decrease being 6·5. Part of this decrease was inevitable; because the high birth-rate in the preceding decade was a result not merely of the normal conditions prevalent during 1881-91, but also of the fact that these normal conditions followed a period of distress and scarcity. As soon as the effect of this was over, the birth-rate was sure to go down even if normal conditions had pre-

¹ Madras Census Report, 1901, pages 28-29.

vailed in this decade. Of course the scarcities and plague do seem to have affected the movement of population to a very great extent as the fall in the birth-rate shows. It has been estimated that the total diminution of population owing to famine conditions prevalent in 1897 alone, amounted to over 2,00,000 persons.

The decade 1901-11 may be regarded as a normal one in point of material conditions. The birth-rate was, therefore, as high as 41·9. It was less by 3 per mille than the rate in the previous decade. The effects of the severe famines at the end of the last century seem to have continued in the beginning of this century. Apart from the uniformly high rate which is generally found in normal years, this decade presents no special feature.

The last decade (1911-21) was eventful in many respects. It saw the beginning and end of the great world war. It also witnessed the outbreak of influenza. The influence of War on the movement of the birth-rate cannot be gauged exactly. The influence of the influenza epidemic can be easily seen from a comparison of the year to year birth-rate. As usual under such circumstances the rate shows sudden and wide variations.

Year.	Birth-rate per mille.
1911	30·4
1912	30·9
1913	32·2
1914	33·5
1915	31·2
1916	32·5
1917	32·4
1918	28·9
1919	25·5
1920	28·4

The early years of the decade being normal in point of material conditions, the birth-rate continued to be high with variations to a greater or smaller extent. But in the year 1918, which saw the outbreak of influenza, the birth-

rate suddenly went down from 32.4 in 1917 to 28.9 and further down to 25.5 in 1919. In the last year of the decade the rate slightly recovered, but it was still as low as 28.4. These wide fluctuations are, as we have seen, a characteristic feature of our population figures.

The Movement of the Birth-rate in the Bombay Presidency

The same tendency for the birth-rate to depend on the conditions of the season is to be found in Bombay. The birth-rate according to the Census of 1872 was 41.05. The registered birth-rate for 1876 was 23.4. This is, however, notoriously below the truth and as Mr. Elliot wrote in the Famine Commission's Report of 1881 "The lowest estimate that can be accepted, places the birth-rate in India at about 40 per mille and therefore the births of a normal year like 1876 should be raised from 23.4 to 40 per mille....." The following two years, however, saw a sudden reduction in the birth-rate, which was, according to the registered figures, 20.9 and 16.1 for 1877 and 1878 respectively, or 35.6 and 27.5 respectively, if we make allowance for the faulty registration as in 1876. This was due to the famine of 1876 which began to be felt slightly from August 1876. In 1877 the birth-rate in the famine districts fell from 26 to 20, but that in the non-famine districts rose from 20.1 to 21.8. In the following year, however, owing to prolonged distress, the birth-rate in the non-famine districts also dropped down to 19, while that in the famine districts stood at the abnormally low figure of 13.8.¹

The birth-rate of 1879 also suffered to a great extent from the effects of famine. The variation percentage from

¹ BIRTH-RATE PER MILLE IN THE FAMINE AND NON-FAMINE DISTRICTS

	1876	1877	1878
Famine Districts	26.7	20.3	13.8
Non-famine Districts after allowing for defective registration	20.1	21.8	19.0

the average of nine years was 6.47. But in 1880 the birth-rate began to recoup itself and the percentage of variation for the average of 9 years was 16.33.

The ten years between 1881 and 1891 were normal years in which there was no famine and "not even a particularly bad harvest". The birth-rate was as high as 50.3. This was to be expected. In India normal years mean a high birth-rate, more especially when they follow some such disastrous calamity as the famine of 1876-79.

The following decade, however, was eventful. Plague first made its appearance in 1896 in the City of Bombay, and gradually spread all over the Province. It is well-known that plague reduces the birth-rate in a two-fold way, first, by causing a heavy mortality among persons of reproductive ages, and second, by producing temporary sterility owing to prolonged sickness. In this instance, however, the reduction caused in the birth-rate need not have been great. But then came the famine of 1896-97. Severe as it was, this famine was followed by a still more severe one in 1899-1900, which affected an area twice as great as the famine of 1876-78. This calamity not only caused great distress in the Deccan which had already been affected by famine in 1896-97, but it also extended its sway to the fertile plains of Gujarat. The birth-rate was, therefore, naturally affected, and it stood at only 43.9 as against 50.3 in the preceding decade, in spite of the fact that the first five years of the decade were normal ones, with a comparatively high birth-rate. How great a set-back is given by famines to the birth-rate can be easily seen from this.

The fluctuations in the birth-rate, are as usual under such circumstances, very violent. Some idea of the tendency can be had from the following table which gives the number of births for certain districts for 1899 and 1900. What is remarkable is that the 1899 birth-rate uniformly kept its high level instead of going down. Indeed, in some

of the districts, it was highest in the decade. The sudden fall in the next year, is, of course, the result of famine which cut off persons of reproductive ages in large numbers.

Districts.	No. of births in 1899.	No. of births in 1900.
Kaira	36,553	15,068
Panch Mahals	12,420	5,676
Ahmedabad	33,547	17,641
Surat	25,333	20,306
Broach	12,066	8,499
Ahmednagar	40,621	24,847
Poona	35,458	29,211
Sholapur	29,662	21,328
Satara	41,135	34,607
Khandesh	77,190	45,532
Nasik	41,584	27,287

The decade 1901-11 was characterised by frequent scarcities. According to the Census Commissioner for Bombay, "with three good years and four bad ones following on a succession of lean years, crops have been below the average and prices have advanced". But the most outstanding feature of the decade was the havoc caused by plague which took a toll of 14,14,000 lives.

Even after making allowance for defective registration, the birth-rate during the decade seems to have been at a very low level; for, the great scourge of plague was working havoc through the Presidency, and acting as a two-fold check to the birth-rate. A series of lean years which followed each other in quick succession gave an impetus to the tendency.

The last decade (1911-1921) was remarkable for two things, first, the sharp rise in prices towards the end of the

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decade, as a result of post-war conditions, and second, the violent influenza epidemic. The seasonal conditions of the decade were generally satisfactory with the exception of the year 1911 which was a bad one.

The following table furnishes the movement of the year to year birth-rate :—

Year.	No. of births.	Rate per mille.
1911	7,05,090	36·00
1912	6,84,890	34·97
1913	6,84,803	34·96
1914	7,33,076	37·13
1915	7,26,780	37·10
1916	7,04,672	35·98
1917	6,99,823	35·73
1918	6,10,221	31·61
1919	5,46,460	27·90
1920	5,93,175	30·28

The above figures indicate the high level at which the birth-rate stood till 1918. These years were generally free from scarcities and epidemics, and so such a high birth-rate was only to be expected.

The last three years of the decade, however, were abnormal owing to the influenza epidemic. This great scourge raged fiercely throughout the province, and introduced wide variations in the vital statistics. The effect on the birth-rate can be easily seen from the table. In 1918 the birth-rate suddenly dropped down to 31·61 per mille. This was followed by a still more violent drop to 27·90 in 1919. In 1920 the birth-rate showed signs of recovery and stood at 30·28, a figure which is, however, far below the average rate for the first seven years of the decade.

Movement of the Birth-rate in Bengal

The Bengal birth-rate evinces the same tendencies as that of the Bombay and Madras. In normal years it is quite high. But it is frequently checked, either by famines or epidemics, or by malaria which is a special peculiarity of this province.

During 1872-1881 the birth-rate was generally high, being 47.9 per mille. Its movement throughout the decade was not, however, uniform. It varied according to the conditions of each year. The following figures were cited by the Census Commissioner for 1881 to show that the birth-rate was especially high during certain years and low during others.

No. of children alive on the Census day.	Age.	Born in
22,20,142	4	1876
25,48,457	3	1877
21,30,034	2	1878
16,79,504	1	1879
16,11,449	Under 1 year	1880

In explaining these figures, the Census Commissioner wrote, "This then is the suggested explanation of the unexpected variation between the surviving population of each of the first five years of life, viz., that while the births in 1876 and 1877 were probably more numerous than usual, owing to the general prosperity of the people during the two preceding years, the survivals were also comparatively large owing to the existence of conditions favourable to infant life." On the other hand, the births in 1879 and 1880 were probably fewer, and the infant mortality greater than usual, especially in the latter years, because the unhealthiness of 1879 checked the births both directly and indirectly, and because the fewer children who were born were exposed to a greater mortality."¹

¹ Census Report, 1881, Vol. I, pp. 124-125.

The variations in the number of births, as will be clear from the above table, are very wide. They are the expression of the over-sensitiveness of our population even to slightly adverse changes in the economic as well as physical environment. When people are living on the margin of starvation, any departure from the normal state, however slightly prejudicial must affect them to an extreme degree. This is what happens in India. If the people had adequate stamina and resisting power, which a well-fed population must have, scarcities and epidemics need not have caused such violent changes in our vital statistics.

The birth-rate for the decade 1881-91 was 52.9 per mille, the highest on record since 1872. The decade being a normal one, all abnormal conditions like famines or epidemics were absent during this period. It was therefore natural that the birth-rate should continue to be very high throughout the decade ; for, as we have seen in the preceding pages, normal years in India mean a high birth-rate.

The period 1891-1901 was mainly a reaction against the normal conditions of the preceding decade. . Famine paid a visit to the province accompanied by cyclones. Plague took its heavy toll of life and the mortality from this cause alone was estimated at 1,50,000. Thus all the forces tending to reduce the birth-rate were present, and it naturally dropped to 43.9 from 52.9 per mille in the preceding decade. Such sudden changes in the rate are, as we have seen, a characteristic feature of its movement in this country.

The decade 1901-11 was favourable to a rapid growth of population. The following table which gives the rate of increase decade by decade since 1872, will show that during these ten years, population increased more rapidly than in any other period.

POPULATION PROBLEM OF INDIA

Period.	Rate of increase per cent.
1872-1881	6.7
1881-1891	7.5
1891-1901	7.7
1901-1911	8.0

The harvests during the decade were on the whole satisfactory, and the decade may be considered a normal one in point of material prosperity, though the rice harvest was poor in 1905 and the three succeeding years. There is nothing peculiar about the movement of the birth-rate, which continued to be high as the following table will show.

Birth-rate per 1000 of Population of 1901

Year.	Birth-rate.	Excess of birth-rate over death-rate.
1901	37.7	7.4
1902	38.1	4.0
1903	36.7	4.5
1904	40.9	7.7
1905	37.8	1.3
1906	35.4	2.1
1907	35.9	2.3
1908	37.9	6.1
1909	39.3	8.1
1910	37.7	6.3

The last decade cannot be called a normal one in point of material prosperity. With the violent influenza epidemic, the malarial scourge, and the high prices during the war and the post-war period, the people must have had a very hard time to keep body and soul together. The full significance of the malarial scourge as a check to the

population of the province can be gathered from the following remark—".....Malaria has long been the special scourge of the province. It is not only responsible for a heavy mortality, but it saps the vitality of the survivors and reduces the birth-rate. Except in the neighbourhood of Calcutta, where industrial development is the chief factor the growth of the population is chiefly determined by the varying prevalence of malarial affections."¹

It is no wonder therefore, that the birth-rate throughout this decade was lower than during the preceding one. The actual number of births recorded in 1901-10 in Bengal was 1,51,97,394 and in 1911-20 1,48,60,257 or a decrease of 9,37,087. The average birth-rate based on the population at the beginning of the decade, shows a fall from 36.84 per mille per annum to 32.25. The following table gives the average birth-rate for each year, and, when compared with that giving the birth-rate for 1901-10, clearly brings out the low fecundity of the decade.

Year.	Birth-rate per mille.
1911	35.0
1912	35.3
1913	33.8
1914	33.9
1915	31.8
1916	31.9
1917	35.9
1918	32.9
1919	27.5
1920	30.0

We see that the good conditions and consequent high birth-rate of the preceding decade (1901-11), are followed by adverse circumstances and a low birth-rate. Through-

¹ Census Report, 1911, para. 100

out the decade, the rate continued low, and influenza lowered it still further during the last few years of the decade.

Conclusion

The above survey will make it clear to the reader that the movement of the birth-rate in this country is greatly influenced by the positive checks of famine and epidemics. The violent fluctuations of the rate between one decade and another, and the wide, year to year variations, are only an indication of the continuous attempt made by Nature to prevent population from multiplying beyond the lowest limit set by subsistence. The true extent of the check thus given, can only be gauged from the fact which clearly emerges from what is said in the preceding pages, that years of low fecundity, consequent on the existence of adverse conditions, are becoming more and more common. In fact, taking the whole of India into consideration, the decade 1881-91 was the only period when no great obstacles came in the way of the normal reproductive power of the Indian population. The rate of increase during these ten years was, therefore, somewhat rapid. But India had to pay a very heavy penalty for this progress, in the series of epidemics and famines that devastated the country during the thirty years. Indeed, a return to the conditions of 1881-91 seems quite impossible. Since 1891, the growth of population in India is essentially a history of the continuous operation of the positive checks to the generative power of population.¹

¹ Relative Rates of birth for the period 1881-1921.

Province.	Birth Rates.			
	1881-91	1891-1901	1901-1911	1911-21
Bengal	52.9	43.9	46.7	38.0
Bombay	50.3	43.9	41.0	32.6
Burma	—	—	42.9	29.8
Madras	51.3	44.8	41.9	37.0
Punjab	46.8	47.1	44.3	41.5
United Provinces . .	45.1	44.7	46.5	34.4

CHAPTER VIII.

NATIONAL DIVIDEND AND STANDARD OF LIFE

The population problem of a country like England, or America, is generally how to maintain, and if possible, to raise the present high standard of living, which is far above the minimum requirements of human existence.¹ Fear of over-population in such countries does not so much mean fear of starvation, but an anxiety to escape the horrors of a low standard of life. Many of the European countries can support a population much greater than their present number, without causing actual starvation, if they only forego some of their comforts and are prepared to be content with the bare necessities of life. The fact that they do not do this and view any departure, however slight, from their present standard, as a matter of grave concern, reflects an intelligent outlook on the population question. Every effort is made by individuals and the State alike, to maintain this high standard which alone is considered to be consistent with general efficiency, national safety, and national prosperity. According to these nations, a happy solution of the problem consists in allowing the growth of population to that point only where material well-being for all is assured, and provision is made for an automatic progress by leaving a surplus of production over consumption in the hands of the average man. Any increase of population beyond this point is to be regarded as a sure indication of over-population.

This modern idea of over-population, however, is quite

¹ The Food Committee of the Royal Society estimated that in the pre-War years 1909-1913, the consumption of food in United Kingdom supplied each person with an average of 3091 calories, whereas the minimum requirement was no more than 2618 calories.

different from the Malthusian conception of the same problem. According to Malthus, an unchecked population invariably multiplies to the lowest limit set by subsistence, and then shows a tendency to outrun it. This tendency is however, restricted by positive checks which come into existence because of the want of food. Thus, over-population in the Malthusian sense, cannot last long, since it is impossible for man to live and increase without food.

It may be observed that any nation which wants to progress at all, must take note of the modern outlook on the question of population. It should not be content with a mere increase in population without a corresponding increase in the national dividend. Before adding to its population a nation must first see that the standard of life of its inhabitants is a sufficiently high one, to ensure their efficiency as producers, and to guarantee their moral and intellectual progress as human beings. To realise this, it will have to arrest the growth of population far above the lowest point set by subsistence, a point at which even the bare necessities of an efficient life are not satisfied, with the result that positive checks have to operate every now and then.

So far as our country is concerned, we find that population has already reached this lowest point, to judge from the growing intensity of the positive checks. This has already prepared us to expect a very low standard of life in this country, and our expectations are thoroughly realised as can be seen from what follows.

A Review of the Estimates about the National Dividend of India

Calculations about the average income in India have been made from time to time, and all these go to prove the abject poverty of the vast masses that comprise the Indian population. Dadabhai Naoroji, who is the pio-

neer in this branch of Indian economic enquiry, in his 'Poverty and un-British rule in India', estimated India's per capita income for an average good season to be 40 sh. (Rs. 20). And then he added, "When further allowance is made for exaggeration in these figures and for bad seasons, I cannot help thinking that the result would be nearer 30 sh. (Rs. 15) per head".¹ Considering the figures for necessary consumption, Dadabhai arrived at the conclusion that the production per head was so low that the people on an average received much less food and clothing than a criminal in jail—"let alone all little luxuries, all social and religious wants, all expenses on occasions of joy and sorrow and any provision for bad season".² According to him the still more pitiable condition of the majority of the population in the lower strata of society, could be imagined by remembering that the middle and the richer classes have got far more than the average income per head at the expense of the dumb millions.

The results of Dadabhai's investigations were more or less substantiated by the calculations of Sir David Barbour. According to him, the average income per head was Rs. 27 in 1881.

Mr. Digby's calculations made in 1900 put the per capita income at Rs. 18-8-11 for a good year, and at Rs. 12-6-0 for the famine year of 1899-1900.

In 1901 Lord Curzon replying to the remarks of Mr. Digby and others placed his figure at Rs. 30.

Ten years later, Mr. Findlay Shirras made certain calculations which showed an income of Rs. 50 per head.³

The latest calculations as regards the Wealth of India have been made by Mr. Khambatta. In "the Wealth and Taxable capacity of India", he comes to the conclusion that in the latest years for which statistics are available,

¹ Dadabhai took the figures for 1867-1870 for his calculations

² p. 31, *Ibid.*

³ Working class Budgets, p. 11, published by the Bombay Labour Office.

the gross income per head comes to Rs. 74 but taking the last eight years it is Rs. 58½. In the early years of the century and before the Great War it was Rs. 36; while the general gross income during the years 1901-22 is Rs. 44½.¹ Further he observes "Although the gross per capita income is Rs. 74 there is also a great inequality of incomes, the highest one being a couple of hundred-thousand. This inevitably means that the income of the poorer sections of the population is something less than Rs. 74." In view of this, he thinks that the average income of the masses may be less than Rs. 60 per head; and it is out of this that the ryot has to pay his taxes, interest on debts etc. Well may Mr. Khambatta ask, is this the Wealth or Poverty of India?

It cannot be argued that in spite of our low per capita income we have sufficient food to maintain ourselves in health and strength. The Bombay Labour Office Inquiry of 1921-22 into the budgets of working classes, whose per capita income is generally found to be much above the average for all India, suggests that this is far from being the case.² According to the Report "the general conclusion is that industrial workers consume the maximum of cereals allowed by the Famine Code but less than the diet prescribed in the Bombay Jail Manual". It is quite deplorable that the honest labourer who toils day and night to secure his livelihood, should get less of the necessities of life than a criminal who is considered to be a danger to society.

The low standard of life thus indicated can be taken as an index of the great disparity between the growth of population and production in this country. The industrial labourer, much less the cultivator, is unable to have even the bare necessities of life, with the result that the

¹ This book was published in 1924

² The income of an average working class family consisting of 4.2 persons as given in the report is Rs. 52-4-5 per month

latter class suffers immense hardships, when an extraneous circumstance, like a famine, occurs. It seems to be living on the margin of starvation ready to die at the slightest shock.

That this is a very grave state of affairs will be admitted by every one. But the gravity of the situation becomes still more serious, when the great discrepancy between what we must necessarily do to get out of this unsafe position, and what we can do is taken into account. The problem before us is not only to maintain the present standard of life, but to raise it appreciably so as to make for an efficient human existence. This can only be done either by immediately increasing production, or by gradually reducing population for some time to come. But the problem presents innumerable difficulties, which we shall consider in the following chapters.

CHAPTER IX.

FACTORS AFFECTING FOOD-SUPPLY

We have so far come to the conclusion that there is a growing maladjustment between production and population in this country. We shall now consider the problem from the point of view of production or of the means of subsistence. Without going into unnecessary details, we shall concentrate on the main factors affecting food-supply, which will enable us to realise the extent to which greater production in this direction is possible.

Factors affecting Food-supply before and after the Industrial Revolution

Before the advent of the Industrial Revolution, which linked up the whole world into a huge market and effected the transition from 'local to international economy', each country produced sufficient food to feed its population. Food-grains formed a very small item in either the exports or imports of a nation. A country's food-supply in those times was determined chiefly by the extent of cultivation, and the level of production, in its own limits.

The discoveries of the 19th century completely revolutionised the state of affairs. The same process which enabled England, the mother country of the Industrial Revolution, to produce manufactured goods and scatter them far and wide into the countries overseas, enabled these latter, especially America, to send out food-grains, which they could produce cheaply. The result was that 'American wheat began to compete with English wheat, especially after the railway had penetrated the great cen-

tral plains of America. Wheat prices began to drop, and reached their lowest level in 1894-95. English farmers thereafter found it very difficult to compete with their American brethren, and by 1900 much land had gone out of cultivation. During all this period, population was increasing rapidly under the stimulus of the Revolution, with the result that in Great Britain, which at the beginning of the 19th century was self-supporting so far as food was concerned, the population had by 1900 doubled itself. Henceforward, the supply of food-grains to the English population was not determined by what she herself could produce, but by what foreign countries like America could produce, and what she herself could offer in exchange.

This happened not only in England but in many other countries which followed her in a policy of industrialisation. In most of these, industrialisation meant the dependence of an important factor in the population problem—the production of food-stuffs—on conditions other than local, or on world supply. This shifting of the plane of one side of the equation was a remarkable feature of the Industrial Revolution. Though we still view the problem from an essentially national outlook, and talk of the population problem of Japan or India or Great Britain, the one limiting condition which determines the growth of population, is beyond the control of individual nations.

If India refuses to send food-grains to Britain in exchange for British goods and services, or if tomorrow America lays a complete embargo on the export of food-stuffs, England's overgrown population must necessarily starve. In that event English statesmen would begin to doubt seriously the wisdom of any addition being made to the population.

On the other hand, India and America may continue to export food-grains in millions of tons, and still England may be reduced to the verge of destitution, if these countries together with others, refuse to export to Eng-

land, the raw material which forms the very basis of her industrial prosperity. This would deprive England of purchasing power, in the form of manufactured articles, wherewith she buys the food produce of other countries. The case of England may be considered to be an extreme one, but nevertheless it points to broad facts which are applicable, *mutatis mutandis*, to many other nations.

Coming to India, we find that unlike England, India is not an importer of food-grains, at least in any large quantity. Her teeming millions are fed, or rather ill-fed, from her own resources. It may be said that the food-supply of India is determined by the extent of cultivation and level of production within her boundaries. But here also we have to introduce certain qualifications. If in England the imports of food-stuffs determine the quantity available for home consumption, in India it is the exports that determine how much of the agricultural produce should be consumed by the children of the soil. Exports of food-grains form a considerable proportion of the total export trade of India.

It must be pointed out that the exports of food-grains from India do not necessarily mean a surplus left after meeting the home requirement. Large quantities of rice and wheat are exported from the country, even though a large number of people in the country are known to be living on insufficient food. With a large price offered by the foreigner on the one hand, and with a low purchasing power of the people within the country on the other, we find that this unfortunate situation comes into existence.¹ When we consider the food supply of the country, we shall, therefore, understand that it is the total production minus the export.

When production of food-stuffs is considered from the view-point of the population problem, two important

¹ For a fuller discussion of this idea, see the volume on "Trade and Industry" in this series.

questions arise : (1) whether production of food-stuffs has increased, or remained stationary with the growth of population ; (2) whether the land under cultivation is yielding what the cultivator has a right to expect, considering the progress of science and the yield of land in other countries.

The first question is generally treated as equivalent to whether acreage under food-grains has proportionately increased or decreased with the growth of population. The fallacy in this method is obvious. As will be shown, with respect to India, the acreage under cultivation may increase, but the yield may not increase proportionately ; or, as it may happen, the area under cultivation may diminish and the yield may increase. Nevertheless acreage under cultivation is regarded as a rough test of the progress of the agricultural industry of a country, because estimates of yields are either not available or are very inaccurate.

Growth of Food Supply

The following table shows the growth of cultivation of food grains since 1899 :—

Area under food grains in lakhs of acres.¹

Year.	Lakhs of acres.
1899-1900	1650
1900-1901	1820
1901-1902	1840
1903-1907	1950
1911-1912	1950
1912-1913	2020
1913-1914	1920
1914-1915	2050
1915-1916	2040
1916-1917	2090
1917-1918	2070

¹ Agricultural Statistics of British India.

Year.	Lakhs of acres.
1918-1919	1780
1919-1920	2000
1920-1921	1870
1921-1922	2050
1922-1923	2060
1923-1924	1970
1924-1925	2000
1925-1926	1960
1926-1927	1990

The statistics given above show a tendency for the acreage to increase more and more slowly, though the year to year fluctuations are too wide to be accounted for by a single cause. The area under cultivation may be said to have increased continuously till 1916-17, when it reached its upper limit. Thenceforward it began to show a definite decline. Much of the decline in 1918-19 may have been due to the ravages of influenza; but it persisted in the two following years, and though the average rose in 1921-22 and 1922-23, the figures of these years are below those of 1916-17. There was again a fall in 1923-24, followed by a recovery in recent years.

This tendency for the acreage under food-grains to increase more and more slowly is also shown if we look at the figures in another way, as under :—

Period of five years.	Average area under food grains. Lakhs of acres.	Percentage increase or decrease over preceding period.
1900-1905	1880	—
1905-1910	1981	5.5
1910-1915	1993 ¹	3.0
1915-1920	1995	0.08
1920-1924	1986	0.7

These statistics show a definite tendency, first for the rate of increase in the acreage to slow down; and, second,

for the total acreage to decrease. It must be remembered that this decrease or slow rate of increase is observed in a period in which there was a continuous rise of prices.¹ The great war made extraordinary demands on India's produce. During 1905-15 prices were consistently rising; they rose to giddy heights during 1917 to 1920, and the tendency continued for a few years after.

If we read the movement of prices together with the movement in acreage, we find that in the earlier period, under a comparatively slow rise of prices, cultivation advanced somewhat rapidly. During 1910-15 the rise in prices was greater, but the rate of increase in the acreage had already slowed down. Prices rose to extraordinary heights from 1915 to 1920, and it is strange that the rate of increase in the acreage slowed down to such an extent that cultivation remained stationary. In the following period prices were still high but instead of an increase there was a real decrease in the acreage. These facts strongly support our proposition regarding the slow rate of increase of the area under cultivation.

The importance of this tendency is obvious. It definitely sets a limit to a rapid extension of cultivation in India. An elastic food-supply is the prime necessity for a healthy growth of population, but when this is not possible, the situation becomes dangerous. The danger will be still greater during a period of falling prices. We have seen that even when prices were still high, there was a shrinkage in the acreage. If prices continue to fall, as in recent years, and that too over a long period, much land will go out of cultivation, and the food-supply of the country instead of increasing may decline. This danger has not as yet attracted much attention. We shall refer to this question once again in connection with the sub-division of holdings.

¹ See "Currency and Prices in India," in this series.

Relative Growth in Acreage and Population

It will be argued that if the increase in acreage has so far kept pace with the growth of population in this country, then there is no need for alarm. Such an argument, however, commits a number of fallacies. In the first place, it assumes that we have been producing sufficient food to feed ourselves, and what is left for us is only to see that the area under food-grains increases proportionately with the growth in population. This assumption is, as we have already seen, not correct. This argument also fails to take account of the future. Population and acreage may keep pace with each other for some time ; but whether such a tendency will persist at least for some time to come, or whether it is only a consequence of exceptionally favourable circumstances, like rising prices, has to be explained. By itself, a growth in area proportionate to a growth in population does not indicate that such a growth will continue in the future.

Bearing these limitations in mind, we may try to examine the contention that growth in area under food-grains has kept pace with the growth in population. At the outset it must be stated that such a contention is seriously challenged by many. Mr. Datta in his "Enquiry into the Rise of Prices" states that the growth in the area under food-grains has lagged behind the growth in population and cites the following figures :—

Table¹ comparing the growth of population with that of production of food-grains and the extension of cultivation, by means of index numbers:

	Average of the quinquennium 1880-91 to 1894-95.	Average of the quinquennium 1895-96 to 1900-1906.	Average of the quinquennium 1900-01 to 1904-05.	Average of the quinquennium 1905-06 to 1909-10.	1910-11.	1911-12.
Population	100	101.6	103.7	105.7	107.8	108.4
Total area under cultiva- tion.	100	98.0	103.0	105.0	108.0	106.0
Area under food- grains.	100	96.0	101.0	102.0	106.0	103.0
Production of food- grains.	100	98.0	105.0	99.0	113.0	109.0

These figures show that population in India tended to outrun the supply of food-stuffs during the period. But

¹ K.L.Datta, "Enquiry into the Rise of Prices" p. 58. Commenting upon these figures Mr. Datta wrote "It may safely be concluded from the above, that population has increased by a larger percentage in the period under enquiry than either the total area under cultivation, the area under food-grains or the total production of food-grains or, in other words, the requirements of food-grains for internal consumption have increased in a larger proportion than the total production of food-grains". He then puts forth certain considerations to suggest that this did not necessarily mean a contraction in the food-supply of the people of India as a whole. "It should however, be mentioned" he writes "that the total consumption of food-grains includes not only the consumption as human food but also consumption as seed-grain and cattlefood. Whenever there is a scarcity, consumption as cattle food goes down considerably as owing to high prices people cannot afford to feed their cattle with grain. Further, in good years, a stock of food-grains is generally laid by, by the agriculturist which is utilized in times of scarcity—a famine. The export of food-grains also goes down in unfavourable years and import rises, and thus, though the actual percentage of the growth of production may, in any period, be smaller than the growth of population, it should not necessarily be assumed that the total available food-supply in the country was actually very short of the requirements of human consumption."

it may be argued that these figures were not accepted by the Government of India, and therefore cannot be quoted with authority. The Government of India produced figures of their own which indicated "an almost precise parallelism between the growth of population and the extension of food cultivation." The figures given by the Government of India were as follows :—

	Quinquennial averages.				
	1890-91 to 1894-95.	1895-96 to 1899-1900.	1900-01 to 1904-05.	1905-06 to 1909-10.	Average 1910-11 to 1911-12.
Area in thousands of acres . .	101,121	93,978	101,215	103,055	103,332
Index number .	100	92.9	100.1	101.9	102.2
Population in thousands . .	99,649	100,029	101,008	102,883	103,018
Index number .	100	100.4	101.4	102.7	103.4

The parallel movement of population and food-grains is easily seen from the table. During this period production kept pace with population. Those who regard increase in the extension of cultivation proportionate to the increase in population as a fit test for denying the existence of a population problem, and do not consider how the increase in both cases was obtained, may rest satisfied with these figures. But if we bring to bear upon these figures the limitations, mentioned above, which such an assumption implies, we shall realise the true position.

Besides, if we carry the comparison to more recent years we get interesting results, as shown below :—

Year	Population in crores	Percentage increase	Area under food-grains crores of acres	Percentage increase
1911	31.5	—	18.8	
1921	31.9	1.2	19.9	6

The growth in acreage is five times that in population. A superficial observation of these figures may lead one to the conclusion that there was a tendency in this decade for food-supply to outrun the growth of population, but when we remember that this decade was dominated by the effects of influenza in its latter part, we must read the figures in a different manner, as under :—

Year	Population in crores	Area under food-grains in crores of acres
1911	31.5	18.8
1916	not estimated	20.8
1921	31.9	19.9

We thus find the tendency for the area under food-grains to increase, which was in operation up to 1916, arrested, and a definite fall in subsequent years, due to the influenza epidemic. In view of this, the percentage comparison of the figures of 1921 with those of 1911 does not give us a correct perspective. If we take into account figures of recent years, we find that the acreage has not yet reached the level of 1916, the figure for 1925 being 20.6 crores of acres.

The Question of the Yield

The question of the total yield of agricultural production or yield per acre is closely connected with the

extension of cultivation. If a country can double, or triple and thus increase its total agricultural produce on the land already available, it will be in a position to provide for a larger population.

The yield from land depends on a variety of factors. Though manuring of land has been common from early times, it may be said that before the modern discovery of artificial fertilisers, the yield per acre was determined by the natural fertility of soil, which decreases under certain conditions. In modern times, the yield may be said to depend on the progress of science with respect to manures and implements. Other extraneous factors such as the nature of the land-tenure also enter into consideration, but we shall pass them over.

With regard to India, this question can be treated from two points of view. First, whether we have begun to experience diminishing returns from land, and second, whether the full benefits of modern science, as represented by the yield per acre of foreign countries, have been realised in this country.

The Law of Diminishing Returns and Indian Agriculture

In the classical conception, the Law of Diminishing Returns had special reference to agriculture. It was supposed that land was peculiarly amenable to this law while industries were subject to the Law of Increasing Returns. Recent investigations have, however, shown that all agents of production come under the operation of the former.

The law in its general form implies that the application of more capital and labour to land, will increase the yield of the land in greater proportion than the additional amount of capital and labour up to a certain point ; but that after this point of maximum return is reached, every addi-

tional dose of capital and labour will, other things being equal, result in a less than proportionate return. The phrase "other things being equal" implies that there is no change in the methods of production. Though allowance is thus made for an increase in skill, giving increasing returns to capital and labour, the validity of the Law is not in the least compromised, because, according to it, decreasing returns will soon follow a period of increasing returns. Any advance in agricultural science may at the most postpone the evil day, but it cannot defy the operation of the Law for any considerable length of time, and assure an ever-increasing return to capital and labour.

We shall now try to see whether more capital is being applied to land in India and whether it is giving Diminishing Returns. In order to ascertain this, we shall take into account the available figures of area and yield of two principal crops, say rice and wheat. The following tables give quinquennial average of acreage and yield of rice and wheat respectively, and show the variations in the same.

Rice

	Rice acreage in thousands	Yield of rice in thousands of tons	Percentage variation in rice acreage over preceding period	Percentage variation in rice yield over preceding period
1901-1905	50,067	21,550	—	—
1906-1910	56,051	22,291	12·0	3·0
1911-1915	70,252	28,389	25·0	27·0
1916-1920	79,515	32,081	13·0	13·0
1921-1924	80,858	30,163	1·7	—5·8

Wheat

	Wheat acreage in thousands	Yield of wheat in thousands of tons	Percentage variation in wheat acreage over preceding period	Percentage variation in wheat yield over preceding period
1901-1905	25,518	7,676	—	—
1906-1910	26,565	8,092	4.0	5.0
1911-1915	30,550	9,663	15.0	21.0
1916-1920	30,499	9,228	0.0	-4.0
1921-1924	27,282	8,475	-7.3	-8.8

These figures show that returns from land have shown of late a tendency to decrease, not absolutely, but in comparison with the increase in acreage. The average area under rice increased by 12 p.c. in 1905-10, while the yield increased only by 3 p.c. During the quinquennium 1911-15, the yield increased somewhat more rapidly than the area, but during the next quinquennium, the increase in area and yield was nearly the same. The average for 1921-24 shows a decline of 5.8 p.c. in the yield, while the corresponding decline in area is only 1.7 p.c. Production of wheat in the two periods 1905-10 and 1911-15¹ increased more rapidly than acreage, while during 1916-20, when the average area under wheat cultivation was the same as in the preceding quinquennium, the yield fell by 4 p.c. During 1921-24 the decline in yield was 8.8 p.c. as against a decline of only 7.3 p.c. in the area. Other crops also show the same tendency to a greater or smaller extent. For example, in the case of linseed, the quinquennium 1906-10 saw a decline of 13.7 p.c. in acreage and 20 p.c. in the yield. The next quinquennium, however, saw an increase in the

¹ These figures are calculated from data given in the Agricultural Statistics of British India.

yield which was nearly double that in the area. During 1916-20 there was a relatively smaller decline in the yield than that in the area. Rape seed and mustard increased in area by 8 p.c. in 1906 but decreased in yield by 1.9. During 1911-15 the area increased by 5.9 p.c. while the increase in yield was only as much as 23.6 p.c. During 1916-20 the decline in area was 3.9 as against a decline in the yield of as much as 12.4 p.c.¹

These facts clearly show that the increase in the yield has a tendency to lag behind the increase in land under cultivation, and that, therefore, extension of cultivation has been brought about only by bringing poorer land under the plough.²

Relation between Diminishing Returns from Land in India and Capital spent on it

As we have seen, in economic phraseology, Diminishing Returns are said to operate, when every additional dose of capital and labour spent on land beyond the point of maximum return, is followed by a less than proportionate yield. We shall now examine whether the decreasing yields in India are due to an overdose of capital.

The problem of spending capital on land can be treated under three sub-heads (1) manures (2) implements (3) live stock. We must here confine our attention to things as they were in the recent past, and as they are at present, and ask the question whether we are investing more capital in land in the shape of either manures, implements or live stock than we formerly used to do.

To take manures, it has been a notorious fact that in India, land is being robbed of its produce without any attempt being made to keep its fertility intact. Valuable manures have been exported in huge quantities with the

¹ These figures are calculated from data given in the Agricultural Statistics of British India.

² cf. "Currency and Prices in India" pp. 151 and 158.

result that the soil is being exhausted day by day. We try to take as much from the soil as possible, without trying to return any of those elements which make for its fertility. In this respect our position has not improved since 1893, when Dr. Voelcker published his report on "Improvement of Indian Agriculture,"¹ as is shown by the latest enquiry into the subject by the Royal Commission on Indian Agriculture.²

Coming next to the application of capital in the form of implements like ploughs etc., we may generalise that there has been an increase in these kinds of implements which is only proportionate to the increase in area, as will be seen from the following table.

	No. of ploughs in thousands	Acres in thousands	Percentage increase in ploughs	Percentage increase in acreage.
1919-20	23·58	222	—	—
1920-21	23·55	212	·14	-4·7
1921-22	23·67	223	·08	5·0
1922-23	23·70	221	·57	0·79
1923-24	23·69	222	-·04	-1·9

Figures for the earlier years are not available. These figures themselves may not be very accurate, but they may be taken to show the tendency for the instruments of

¹ "It must be accepted as an axiom in agriculture that what is taken off the land in crops must in some way be put back to the soil, or else the soil will suffer exhaustion. It is an equally accepted fact that the production of heavier crops means that more manure must be applied to the land. A country which exports both crops and manures must be declining in fertility. Now what is the state of things as regards India? On the one hand there is a large export of seeds, cotton and other products, besides an increasing one of wheat, all of which remove a considerable amount of soil-constituents. What is returned in their place? Only stems, or stalks and leaves, and it is not even correct to say that they are returned, for after all it is only a portion that finds its way back to the soil." *Improvement of Indian Agriculture*, pp. 39-40.

² Report, ch. IV.

production to increase only in proportion to the increase in area under cultivation, "other things being equal". This means that we do not require more ploughs, that is, more capital, to cultivate a fixed unit of land than we formerly did. It may be argued, however, that other things are not equal because yields from land are decreasing, and therefore for the same amount of capital invested in land we are having proportionately small returns.¹

As regards live-stock, the statistics given in Government publications show a decided increase—an increase greater than that of the area under cultivation. From this we must conclude that we are now supporting more animals on farms than formerly. As the returns from land have lagged behind, this must necessarily mean that more animals are now required to plough the land than were necessary formerly, and even then the results are not the same. This is tantamount to saying that the land is giving diminishing returns to the application of more capital in this form. But here also, as in the case of ploughs, the decreasing returns may be due to a lack of manuring capital and the consequent exhaustion of the soil, rather than to an overgrowth of animals supported by lands under cultivation.

It may be argued that with the increase in live-stock land may be getting more manure than before. This is a reasonable expectation, but in the case of India, it is unfortunately not realised. The poor ryot lives such a hand-to-mouth existence, that he cannot postpone the use even of the cowdung, to employ it as capital for enriching the land. He requires it as fuel and utilises it immediately. A vast amount of capital is thus wasted without adequate return.² In this connection the remarks

¹ With reference to the nature of implements used and the suggestions for improvement see Report of Royal Commission on Indian Agriculture, ch. IV.

² "Every person who visits the agricultural districts of India and sees the fields and houses of cultivators, and who takes any interest or has any

of the Royal Commission on Indian Agriculture may be quoted :—

“The figures suggest the existence of a vicious circle. The number of cattle within a district depends upon and is regulated by the demand for bullocks. The worse the conditions for rearing efficient cattle, the greater the numbers kept tend to be. Cows become less fertile and their calves become undersized and do not satisfy cultivators who, in the attempt to secure useful bullocks, breed more and more cattle. As numbers increase, or as the increase of tillage encroaches on the better grazing land, the pressure on the available supply of food leads to still further poorness in the cows. As cattle grow smaller in size and greater in number, the rate at which conditions become worse for the breeding of good livestock is accelerated. For it must not be supposed that the food required by a hundred small cattle is the same as needed by fifty of double the size. As cattle become smaller, the amount of food needed in proportion to their size increases. Thus large numbers of diminutive cattle are a serious drain on a country in which the fodder supply is so scarce at certain seasons of the year as it is in India. The process having gone so far, India having acquired so large a cattle population and the size of the animals in many tracts having fallen so low, the task of reversing the process of deterioration and of improving the livestock of this country is now a gigantic one; but on improvement in its cattle depends to a degree that is little understood the prosperity of its agriculture and the task must be faced.”

We may conclude, therefore, that there are no signs of additional capital having been applied to the land to any great extent. Manure, the most important form of capital, is seldom used on any large scale, and the soil, therefore, naturally shows signs of exhaustion. When we say that additional capital has not been applied to the land, we have in view only our primitive methods

thoughts about the products of the soil, is at once struck by this most important and most notorious fact, that a very large portion of the manure that should go into the soil to increase its productiveness is used as a fuel for warming the dwellings and for cooking the food and other purposes”—Lupton, *Happy India*—p. 80. cf. also Report of the Royal Commission on Indian Agriculture, 1928, ch. IV.

of agriculture with the ancient plough, and the equally ancient bullock.

The foregoing is sufficient to prove that even under our primitive process of production, sufficient capital has not been spent on land to justify us to conclude that the soil is having an overdose of it, and therefore yielding decreasing returns, but if additional capital is employed, it is sure to set in operation the tendency towards increasing returns.

This, however, does not mean that we can increase our produce from land in any appreciable quantity in the near future. It rather points to the fact that we should not hope to do it, because, as is well known, the dearth of capital in the country is too great to improve the condition of the soil, however slightly.

That this is so, is a very grave state of affairs for this country. With a population which, in spite of enormous checks, is growing; with returns from land diminishing; with the limits to extensive cultivation clearly set; with the tendency for acreage under cultivation to diminish, and with a dearth of capital to meet the demands even of a simple type of agriculture which has been in vogue for many a century, the food-problem of this country seems to be fraught with grave difficulties. Already the positive checks are doing their work; killing young and old, women and men, by thousands, and trying to put handicaps on the growth of population in its tendency to outrun the food-supply. The handicaps have been increasing of late, and yet the increase in population has shown a tendency to outgrow the increase in production.

If a definite solution for solving this problem of finding food for our increasing population is not immediately arrived at, an intensification of these checks may be expected in the near future. An epidemic, which in its virulence may beat even the Influenza epidemic of 1918, may try to restore the balance, or even in spite of our

boast of a brilliant transport service, the Government and the people of India may be faced with the horrors of a wide-spread famine.

It is argued in some quarters that the food-problem of India will be easily solved if we adopt Western methods of cultivation with the scientific system of manuring by artificial fertilisers, and the use of machinery. Comparisons are made between the yield from land in this country and that obtained in foreign countries where cultivation is carried on with the aid and appliance of modern science ; and it is suggested that if we were to follow the methods of these countries our returns from land will be increased several times, and the problem of finding food immediately solved.

Such an argument ignores the conditions under which agriculture is carried on in India. We have seen the absolute want of capital as applied to land even under our simple system of cultivation.

We shall now pass on to the other factor in food-production namely land, and then consider what obstacles are offered to any introduction of Western methods, by our system of land cultivation.

CHAPTER X.

FACTORS AFFECTING FOOD-SUPPLY

(Continued)

Characteristic Features and Present Tendencies of Land Cultivation in India

The most characteristic feature about land in India is the infinitely small holdings into which it is parcelled. This feature is common to all provinces, and is characteristic of village life in India. Practically everywhere, where agriculture is carried on, land is sub-divided into ridiculously small holdings which form a considerable proportion of the total number. The result has been that these holdings have become uneconomic, that is, too small to support a farmer with an average family of 4 or 5 persons. This must necessarily mean that the farmer is living only on the margin of subsistence and dragging out a miserable existence unless he finds some other occupation to supplement his income from agriculture. The following figures about the size and distribution of holdings in some of the main provinces speak for themselves.

*Table giving the Distribution of Agricultural Land
in the Bombay Presidency.¹*

Size of holding	Area covered	Owners
Up to five acres	20,29,461	8,72,485
From 5 to 15 acres	49,32,266	5,29,649
„ 15 to 25 acres	43,37,143	2,21,449
„ 25 to 100 acres	88,54,144	2,06,143
„ 100 to 500 acres	27,77,005	18,173
over 500 acres	5,56,593	551
<i>Total</i>	<u>2,34,86,612</u>	<u>18,48,450</u>

It may be observed here that on holdings of not more than 15 acres, nearly 14,02,134 owners try to eke out an existence. This means that on an area of only 69,61,727 acres, which is less than one-third of the total area cultivated, as much as 76 per cent. of the landowners try to maintain themselves, and that this area is divided into extremely small portions which cannot be expected to support the farmer and his family.

The gravity of the situation is still more aggravated if we try to apply any definite standard of an economic holding to these figures. According to Mr. Keatinge, 40 or 50 acres would constitute an economic holding in the Deccan.² As the figures given above are for the whole Presidency which includes, besides the Deccan, the relatively fertile tracts of Gujarat, we shall reduce Mr. Keatinge's estimate by half, and take 25 acres as consti-

¹ Appendix IV, Report of the Land Revenue Administration of the Bombay Presidency, 1921.

² "In the Deccan an ideal economic holding would consist of say forty or fifty acres of fair land in one block, with at least one good irrigation well and a house situated on the holding." Rural Economy in the Bombay Deccan, pp. 52-53. Mr. Keatinge was Director of Agriculture, Bombay Presidency.

tuting an economic holding for the whole of the Presidency.

If we try to judge the minuteness of the sub-division by this standard what do we find? The following table will speak for itself :—

		Percentage of the total
Owners of uneconomic holdings	16,23,583	88
Area under uneconomic holdings in acres	1,12,98,870	18

The sub-division of land below the economic point has been carried to such an extent that nearly 48 p.c. of the total land is parcelled into holdings which will not give sufficient to the owner to feed himself and his family, and the owners who are in this unhappy position are as many as 88 p.c.

This condition, lamentable as it is, is intensified when fragmentation of the holdings is taken into account. Each of these holdings is made up not of a continuous block of land but by several small plots, often at considerable distances from each other, so that the evils of sub-division are greatly augmented.

Moreover, in the figures given above, we have in mind only the owners of these miserably small plots. But besides the owners, there is a large number of tenants who try to subsist on these plots, for the tendency to sub-let the plots is as keen as ever in India. If we take the number of tenants into consideration, the situation as regards the food-supply of this overgrown population is, to say the least, deplorable and dangerous.

In Madras, to judge from the figures given in 'Some South Indian Villages' by Dr. Gilbert Slater, the sub-division of land is as minute as is found in Bombay. The following figures will tell their own tale.

Size of Holdings in a Village of Ramnad

Holdings			No.	Extent in acres
Between	1 and	10 acres	38	250
"	10 and	25 "	38	649
"	25 and	50 "	12	469
"	50 and	100 "	3	211
"	100 and	250 "	3	171

Holdings of Wet Land in a Tinnevelly Village

Holdings			No. of Owners	Extent in acres
Over	100	acres	—	—
From	50 to	100 acres	1	80
"	20 to	40 "	3	70
"	10 to	20 "	5	60
"	5 to	10 "	40	250
"	1 to	5 "	210	400
Under	1	acre	—	120

In the village of Ramnad, it will be observed that out of a total of 94 holdings, as many as 38 are between 1 and 10 acres, while the extent of these holdings is only 250 acres.

In the village of Tinnevelly, the holdings between 1 and 5 acres occupy as much as 520 acres out of a total of 980 acres, and support 410 owners out of a total of 459. A very considerable number of owners is, therefore, supported on small holdings. Besides this large number of owners, there is also a large number of tenants subsisting on these small holdings.

Tenancies on Wet Lands in a Tinnevelly Village

Holdings	No. of tenants	Approximate extent in acres
Under 1 acre	100	70
From 1 to 5 acres	215	400
" 5 to 10 "	30	200
" 10 to 20 "	5	60

It will be noticed that tenants are most numerous on holdings which are admittedly small, that is, on holdings which are between 1 and 5 acres. The small holdings have thus to support both a larger number of owners as well as tenants.

We need not estimate how many acres will constitute an economic holding in this part. From the figures given in the same book regarding the profits of cultivation of one of them, we may say that a vast majority of these holdings must prove to be uneconomic, especially if we bear in mind the number that these holdings have to support.

As regards the Punjab, it is found that between 290 and 300 lakhs of acres of total cultivated area are divided into 100 lakhs of holdings, and that the average holding is between 2.9 and 3 acres.¹

Even in Bengal, the province of permanent Zamindari settlement, the tendency to sub-divide the holdings is seen to a remarkable extent. The land is divided to such a minute extent that in many cases the holdings are too small to give sufficient employment to the cultivator.² The extremely small number of hired labourers per ordinary cultivating owner, as compared with foreign countries, is also due to the sub-division of holdings.

The evil effects of the sub-division and fragmentation of holdings are greater than the above figures signify, because we find that this tendency is on the increase. It is increasing at a tremendous rate and transforming what were formerly economic holdings into uneconomic ones. During the last twenty years, smaller holdings have been increasing at the expense of larger ones, or rather uneconomic holdings have been increasing at the expense of economic ones. The rate at which these small uneconomic

¹ Interesting details regarding the Punjab will be found in "Wealth and Welfare of the Punjab" by Calvert.

² See Bengal Census Report, 1921, pp. 381-383.

holdings has been increasing is tremendous indeed, as will be seen from the following table which shows the number of holdings of different sizes in 1901 and in 1921 in certain districts of the Bombay Presidency.

Number of Holdings in 1901.

District.	Under and up-to 5 acres.	Over 5 and up-to 25 acres.	Over 25 and up-to 100 acres.	Over 100 and up-to 500 acres.	Over 500 acres.
Ahmednagar	4,484	29,764	34,110	4,228	46
Poona . . .	13,431	30,291	26,361	2,798	36
Sholapur . .	17,790	15,374	26,668	4,424	70
Satara . . .	17,890	31,839	19,590	2,486	65

Number of Holdings in 1921.

Ahmednagar	39,697	75,038	29,087	2,553	120
Poona . . .	76,960	68,410	18,227	1,298	26
Sholapur . .	20,162	61,298	25,828	2,740	87
Satara . . .	1,35,454	71,670	12,387	846	20

We thus find that in Poona in 1921 the holdings under five acres were more than five times those in 1901. In Sholapur they increased by nearly 20 p.c., while in Satara in 1921 they were more than seven times those in 1901. The holdings between 5 and 25 acres also show a continuous increase. In Ahmednagar they have increased by as much as 150 p.c., while in Poona the increase has been nearly 125 p.c. In Sholapur the increase has been 230 p.c., and in Satara it is 300 p.c.

The holdings between 25 and 500 acres or more show a consistent decline, with one or two exceptions, in all the districts.

If we apply our standard of an economic holding to these districts, a standard which is admittedly far below

that given by Keatinge for the Bombay Deccan, the variation in the economic and uneconomic holdings will be as follows :—

	1900—01		1920—21	
	Uneconomic ¹ holdings.	Economic ² holdings.	Uneconomic holdings.	Economic holdings.
Ahmednagar	34,248	38,384	114,735	31,760
Poona	13,722	29,195	145,370	19,551
Sholapur	17,153	31,162	71,460	28,651
Satara	49,729	22,091	207,124	13,253

Variation percentage

	Uneconomic holdings.	Economic holdings.
Ahmednagar	237	—17
Poona	229	—32
Sholapur	317	—7
Satara	314	—31

The economic holdings have generally declined, while the uneconomic ones have been more than doubled in two districts, and more than trebled in two others. The rapidity with which a growing proportion of land is being cultivated under uneconomic conditions, is a matter of grave concern. It indicates danger in a double form. First, because it points out that a larger proportion of the people is now required to subsist on small units of land, mostly uneconomic; and second, because it shows that the tendency for the holdings to be sub-divided, shows no signs of abating, but is increasing rapidly. Before trying

¹ Between 1 and 25 acres.

² Above 25 acres.

to understand what this tendency means for our future food-supply, we shall first consider the relation between an extreme sub-division of holdings and food-production.

Extreme Sub-division of Holdings and Production of Food

The defects of an extreme sub-division and fragmentation of holdings are many and various.⁽¹⁾ Cultivation is made more costly and a considerable loss of land is involved in boundaries and fencing. When every small piece of land is demarcated from others of a similar type, by means of well-defined field-limits, it is but natural that there should be an immense total loss of land.⁽²⁾ An enormous loss of time and labour is also involved.

The most important evil attached to the sub-division and fragmentation of land is the set-back given to production by the impossibility of applying more capital to land. A farmer can apply capital only when he has accumulated it after satisfying his daily needs. If, owing to uneconomic sub-divisions, he is unable to procure even the bare necessities of life for himself and his family, how can one expect him to lay by enough capital to improve the soil? This is what happens in India. The produce of an average Indian holding is generally below the minimum requirements of its holder. He cannot, therefore, be expected to spend capital on land in any appreciable quantity. The soil under such conditions is exhausted quickly. Indeed, so great is the discrepancy between the cultivator's requirements and his incomings, that in many parts of India, even the most ordinary form of capital, namely, cowdung, cannot be used as such, because the agriculturist being hard pressed by his daily wants, consumes it as fuel. It seems the cultivator in India, is not able to contribute anything to the land by way of improving it. In order to satisfy his own urgent

demands he is forced by circumstances to deprive the land of its most normal and legitimate share.

To summarize, uneconomic sub-division of holdings hampers production in two ways. First, it does not allow land to be cultivated to the fullest extent, and second, it almost debars the application of capital to land, and thus prevents an increase in production.

Significance of the Tendency towards Further Sub-division of Holdings

We shall now return to the tendency for the uneconomic holdings to increase rapidly in number. What significance such a tendency has for us? It means that more and more land is being brought under a system of inefficient production, that more and more land is being wasted in boundaries and fences, that more time and more labour are lost in vain, and that less capital is applied to the land than before. The tendency viewed in this way is obviously a dangerous one. The food-supply of the country instead of being put on a sure foundation is found to be in a precarious condition. If such a tendency persists a time may come when we will be faced with an absolute reduction in the food-supply in spite of an extension in cultivation, and, therefore, with a wide discrepancy between production and the needs of a growing population.

We may note another danger in connection with this tendency. As we have seen, any rapid sub-division of holdings beyond the economic point means a rapid increase in the number of holders of uneconomic holdings. That means that year by year, we are becoming more and more dependent for our food-supply on producers, a growing number of whom are unable to satisfy their own meagre wants, and have no economic stamina to tide over any difficulty, however slight it may be. We are thus relying on producers who are very sensitive to any slight

find that the land-rents are rising' presupposes that land-rent in India is the same as economic rent.

Such an argument ignores the peculiar conditions prevalent in this country. India is primarily an agricultural country. It has been calculated that nearly nine-tenths of the total population live directly or indirectly on the produce of the soil.¹ The competition for land is thus excessive and cultivators are, therefore, forced to pay high rents even on uneconomic holdings; this they have to do since they have no other occupation. The cultivator cannot hope to pay this rent as well as to satisfy the bare necessities of life. As rent must be paid, it obviously follows that the cultivator must forego some of the necessities of life. The rent is thus a charge on the irreducible minimum of subsistence, and is of the nature of house-rent, paid by industrial labourers, who have to meet the expenses of food, shelter etc. out of their wages.²

The rent paid by the cultivator in India, therefore, cannot be compared to the 'economic rent' of Ricardo, for whereas the former is the first charge on the income of the agriculturist in India, the latter is only a differential gain accruing to the cultivator of the richer soil. It thus does not encroach on the peasant's income which is left untouched. What we have got here, therefore, is not 'economic rent' but the high price of land for cultivation, which owing to excessive competition the cultivator must pay if he is to live at all, however miserably. The Ricardian conception of 'economic rent', therefore, cannot be applied to India and to try to do so would be

¹ The Indian Taxation Inquiry Committee, Vol. III, p. 119.

² "The rent of an uneconomic holding is not strictly agricultural but more of the nature of house-rent paid by working men in towns, who out of the wages they earn in their various employments, spend certain portions in food, clothing and shelter"—Bailey quoted by Irvine in the Making of Rural Europe.

most misleading.¹ The cause of the rise in rentals will thus be seen to be an increase in land pressure, consequent on the growth of population, and the decline of indigenous industries, and not an increase in the prosperity of the agriculturist. The rise in rentals is an indication of the misery of the peasantry rather than their prosperity.

To what length the peasant can go under similar conditions, when there is no other source of income to him but land, can be clearly exemplified from the history of Ireland. In the nineteenth century, the competition for land forced rents in Ireland far above their economic level. So high were the rents demanded, that the cultivator could never be expected to pay them in full. But the agriculturists had now ceased to be influenced in their demand either by the fertility of the soil or their ability to pay. Their only consideration was to secure a piece of land, and for this they were prepared to give any amount in rent that might be demanded. Of course, they were never able to pay this amount even when they gave in rent almost the whole produce of the land with the exception of a paltry quantity of potatoes, which they retained to sustain their miserable existence.

As the promised rent was generally in arrears, the peasant remained a debtor of the landowner. In spite of this, every attempt was made by the peasant to obtain a piece of land, however small, with all its crushing conditions, because the alternative for him was to starve.

The gravity of the situation in India will now be realized

¹ "Now the conception of economic rent does not arise in this case, because on account of indebtedness the balance between agricultural costings on the one hand and profits on the other, does not show any surplus. The simple conception of economic rent as applicable to land is the tradition bequeathed by Ricardo, but with the growth of the complexity of our land tenures, and of the class of the rent receivers the Ricardian theory does not apply. The Ricardian hypothesis believed in only two persons, namely, the cultivator and the landlord, but we have in between so many immediate rent receivers from the superior landlord to the petty inferior landlord that agriculture does not pay." The Indian Taxation Inquiry Committee, Vol. III, p. 120.

in all its nakedness. Higher rents have been due to the fact that there are too many competitors for land. Economic considerations have ceased to determine land-rents especially in the case of uneconomic holdings. The cultivators choose to pay higher rents because otherwise they have to face absolute starvation; having no other occupation they choose the lesser evil. Under such circumstances a year of drought or of partial failure of rains means an increase in their debt which is accumulating year by year. Again, we find that though agriculture has ceased to be a profitable occupation, a growing population is dependent on this source of income. The situation with regard to the future food-supply thus seems to be fraught with the greatest danger.

We are thus having a repetition of what happened in Ireland in the 19th century. The only difference is that Ireland learnt a lesson from the potato famine. We, on the other hand, have had many famines, even worse than the Irish one, but still we have allowed things to drift in the same old way. This negligence, to take the warning given from time to time by Nature, can result only in one consequence, namely, a still greater check to production and, therefore, to population also. The peril is quite imminent, and may overtake us any time if timely steps are not taken to check this increasing competition for land.

Uneconomic Holdings and Extension of Cultivation

We may further consider the argument that our food-supply can be easily increased by an extension of cultivation. It is argued that there are still vast areas available for cultivation, and if we were only to bring them under the plough, the food-problem not only of the present population but also of an increasing population for years to come will be solved.

The fact of the availability of large areas of cultivable land can be easily granted.¹ It can also be easily granted that even if some portion of this area is brought under cultivation, our food-supply will be considerably increased. But the question is whether the whole of this available area or even a considerable portion of it can be brought under the plough so as to increase our food-supply. The mere fact that there is so much cultivable land does not justify us in anticipating such an event, for land is not the only agent of production. Capital, in howsoever small a quantity, and labour, have to be expended on land before it can produce anything. Capital and labour, even if available, will not be invested in land cultivation if it does not promise adequate returns. The primary condition, therefore, of new land being brought under cultivation is the availability of sufficient capital and labour, and the expectation that they will get a return which is at least equal to what the existing land under cultivation secures for them.

Extension of cultivation is generally brought about by bringing poorer lands under cultivation, since the richer lands are generally already under the plough. This means that the peasant who would cultivate new lands must be prepared to spend a greater amount of capital on land. Can we expect this of our present cultivator, who not only possesses no capital but is indebted to an extreme degree? Such an expectation is not logical in view of what we have said with regard to his inability to till even his tiny holding with any degree of efficiency.

The very fact that the peasant continues to cultivate uneconomic holdings rather than take up a patch of new land, is a sufficient indication that he finds it more profitable or at least less unprofitable at present, to go on ploughing the old land with all its evils of sub-division

¹ The cultivable area not yet brought under the plough is estimated to be more than 10 crores of acres.

and fragmentation, and high rents. Had he found that with his present economic resources it would be to his interest to plough new land, he would have been the first person to do it. His persistence, therefore, in cultivating uneconomic units of old land, and paying a high rent for them, is a sure sign that he does not expect to get better returns, if he were to apply his labour and what little capital he has, to the cultivation of new land. Under these conditions, how can we expect any appreciable extension of cultivation being brought about in the near future?

It may be argued that extension of cultivation has been brought about during the last quarter of a century, and why should it not continue at least at that rate in the years to come. As we have already seen, acreage under cultivation has shown a definite tendency, first to increase slowly, and then somewhat to decrease, and this too in a period when prices were continuously rising. This in itself would justify us in saying that the rate of extension as observed in the previous quarter of a century may not be expected to operate. There is also another reason why we should not expect the same rate to hold good in the near future, namely, the tendency for the holdings to be sub-divided at a very rapid rate. Every stage of sub-division beyond the economic point means a reduction in the capital resources of the farmer. And every step in the direction of extending cultivation means a greater demand for capital to be invested in land. Therefore, with increasing sub-division of land the discrepancy between the amount of capital required by the farmer to be able to extend cultivation, and that which he can command, tends to be wider, with the result that a slower rate of extension must follow. In fact, this was perhaps one of the reasons for the slowing down of the growth of cultivated areas during 1900-1923, when sub-division of holdings was proceeding at a rapid rate.

In view of the fact that the yield from land has shown a tendency to decrease, even if the same rate of extension were to continue, it would not mean a corresponding rate of increase in food-supply.

It is thus clear from the above that too much reliance cannot be placed on the extension of cultivation for increasing the supply of food. What this means will be easily seen from the fact that, the rate at which cultivation extended during 1900-23 was barely sufficient to keep pace with the rate of growth in population. In view of this any possibility of the growth in acreage, even keeping pace with the growth in population in the future, seems to be remote. It would therefore be fallacious to put against the mere fact of the available area for cultivation, the possibility of supporting a larger population, as some writers have done, because an increase in population will tend to lower the rate of extension by a further subdivision of the already small holdings.

This forces us to reiterate that under such circumstances, an adjustment between the relative growth of population and food-supply, will only be brought about by an intensification of the great checks to population that are prevalent in this country. What else can we expect of the above tendency especially when we remember that millions are now living on the margin of subsistence?

Paradoxical though it may seem, an increase in the rate of extension of cultivation can only be brought about by a decrease in the present agricultural population. This would, in the first place, check the tendency towards subdivision of holdings and towards high rents by reducing land pressure. Secondly, this would tend to consolidate the uneconomic holdings into at least economic ones, and make the cultivator more efficient. In course of time such a state of affairs may still further increase the size of the cultivator's holding, so that some surplus may easily

be left to him. Under such circumstances, if the demand for food from non-agricultural population continues to grow, the cultivator can profitably bring new lands under the plough.

The Argument for Intensive Cultivation

The above is a very grave state of affairs, and it must be remedied before our food-supplies come to be determined by every passing economic wind that blows, or by every slight change in the physical atmosphere. As we said before, it is frequently suggested that our population problem will be easily solved by adopting Western methods of intensive cultivation which will increase our production many times. In view of this proposed revolution in our agriculture it is argued that not only have we not outgrown our resources, but we are far below the ideal magnitude of population that this country can support.¹

The fact that the average yield per acre in India is far below that obtained in foreign countries, may be easily granted. It may also be granted, for the sake of argument, that if we were to adopt such modern methods of intensive cultivation, we should be able to support a far larger population, though this is doubtful, because with the adoption of Western methods of production we may adopt the Western standard of living, which is considerably higher than ours, and this might necessitate a reduction in population rather than any addition to it. Even conceding that we should be able to support a larger population, the crucial point is, can we adopt these methods? Is there any possibility of our achieving this agrarian revolution in the near future? Are there any

¹ "In view of the large scope for production in every direction and in view of the increased demand for men in the personal and professional services, it is safe to assert that we have not yet reached, nay, we are still far below the ideal magnitude of population that the country can support." *Wealth of India*, by Wadia and Joshi, p. 49.

tendencies which point in this direction? And finally, what are the possibilities of achieving such a system of agricultural economy, or how was it achieved in Western countries under similar conditions?

We shall first try to answer the last question in connection with England, since England before the industrial revolution was suffering to some extent from this very evil of sub-division of land to an uneconomic point, and because it was also England that first got out of the difficulty by means of a combination of unusually favourable circumstances.

Till the middle of the 18th century, England's agriculture was carried on under what is known as the open-field system. The cultivable land of a village was divided into three great strips and every cultivator would have at least one piece of land in each strip. This system prevented the fields from being properly cultivated owing to the fragmentation of the small holdings that it involved, and also because rotation of crops was impossible under such a system. The result was that even though the best land was cultivated, the returns were very meagre.¹ Agricultural implements were still primitive and the wooden plough was much in use.

With the inauguration of the industrial era, an agrarian revolution, as represented by the destruction of the open-field system, the consolidation of small farms, and the enclosure of common and waste land, was ushered in. This brought the capitalistic farmer and extensive farms into existence. The process meant a sudden transition in the methods of production—a transition from a primitive undeveloped method to a scientific and more modern one. Whereas under the old system the cultivator, with his small farm and wooden plough, toiled hard to obtain a livelihood from a piece of land to which capital could not be applied to any great extent, after the enclo-

¹ Industrial Revolution of the 18th Century—Toynbee.

sure of the commons, the landlord with his large farms and equally large amount of capital could successfully utilize and make agriculture a profitable business. In short, agriculture began to be looked upon more and more as an industrial 'enterprise'.¹

Further improvements pertaining to agriculture during the general process of the Revolution also helped the large farmer in preference to the small, because the successful adoption of the new inventions such as artificial fertilizers and agricultural machinery involved initial capital expenditure, which, only the capitalist farmer could be expected to incur. The small farmer under the old system could never dream of doing any such thing.² The old farmer, who, for lack of capital, was not able to cultivate his small farm efficiently, could not be expected to undertake the cultivation of the big ones consequent on the enclosures. He had, therefore, either to go to the towns to seek employment, or become a land-labourer and hand over his farm to the new adventurous class of capitalistic farmers. At the same time we may ask, why was there such a desire to invest capital in land? Two forces contributed to this result.

England had acquired vast wealth through her industrial supremacy over other nations; even before the Industrial Revolution she had become rich, because the defeat of the Spanish Armada had left no competitor for her in international commerce. The enormous wealth thus obtained, furnished the capital required for investment in land, to make large scale farming a successful business. The desire to sink the new capital in the soil was furnished by the prestige that generally attaches to ownership in land in every country. The new industrial magnates, who owed their riches exclusively to the Revolution, wanted to associate with the landlords, the old aris-

¹ Making of Rural Europe by Irwine,

² Ibid.

tocracy of the country, and therefore they employed large quantities of capital on the soil. Moreover, owing to the rapid growth of population consequent on the Industrial Revolution, prices of food-stuffs were very high in England at this time, so that it was not unprofitable to invest capital in agriculture.

We thus see that in England the agrarian revolution was achieved by men with capital, who were mostly not connected with agriculture before this; and that the capital necessary for bringing about such a revolution was the direct outcome of the vast wealth that accrued to England owing to the Industrial Revolution. Without an industrial revolution, which made a vast accumulation of capital possible, England would not have been able to achieve a revolution in agriculture as well. There was thus a healthy reaction of Industry on Agriculture.

It must be observed, however, that England's position was unique in several ways. She was the first country to take advantage of the new discoveries and inventions which collectively brought about the Industrial Revolution. Moreover, she had a ready market in her colonies and dominions. The continental countries of Europe which followed England's lead were not placed in these favourable circumstances. They had to face a severe competition from England herself, and it was only with the greatest difficulty, and with the aid of state action, that they could make any progress.

Just as the Industrial Revolution was delayed in these countries so was the agrarian one. There was no capital to invest in land to any great extent till industrial progress was achieved. Moreover, in countries like France there was no industrial revolution as such. What happened there during the latter part of the nineteenth century was only a slow process of industrialization; consequently, there was only a slow progress in agriculture. The industrialization of agriculture, and that too

in so short a time, was the monopoly of England only, and was made possible by her capital resources.¹

The agricultural progress of the continental countries and the agrarian revolution in England resulted in a vast increase in the yield of food-produce. In England the yield of wheat per acre was ten bushels before the enclosures. After the enclosures it increased to twenty bushels per acre. By 1870, when artificial fertilisers were applied, and when English soil was day by day being enriched by the use of imported oil cakes and other articles of manurial value, the yield per acre was raised to 30 bushels. In France during 1842-1910 the area under wheat declined from 18 m. acres to about 16 m. acres but the yields steadily increased. The increase during 1896-1905 and 1906-09 was 13 p.c. and 19 p.c. respectively over the figure of 1876-85.² In Germany and France where small farms still persisted, the farmers were slow to learn how to improve the yield from land. Progress in agricultural methods was only made on the large estates, that is, on farms owned by large or capitalistic farmers.

To sum up, agricultural progress in England and the continental countries of Europe was controlled by the amount of capital available for sinking in land. In the case of England, the accumulation of capital was made possible by the prosperity that came to her owing to her extraordinary industrial activities, so that side by side with the industrial revolution there was also an agrarian one which played as important a part as the former during all these years. In the case of the continental countries,

1 "The economic result was that vast wealth accrued to England. And it happened that very much of it was invested in the land. This is at the root of the essential difference between the modern history of land-holding in England and in every other country of Europe; in England agriculture has been made wholly a capitalistic industry; in all other countries it is still mainly controlled and its means of production are chiefly owned by small producers. From about the end of the 17th century the agrarian history of England became exceptional"—*The Making of Rural Europe* by Irwine, p. 126.

² *Economic Development of France and Germany* by Clapham, p. 175.

industrial progress could not be a fact till the State had encouraged it by a system of protection, and in some cases even by providing the required capital. Agricultural progress was also delayed in consequence.

We have now seen the fundamental assumptions of adopting Western methods of production. They are, first, that there must be at least economic farms to allow the application of capital to the land, second, that there must be sufficient capital to enable the landowner to take advantage of modern methods of artificial fertilisers and machinery, and third, some outlet must be found for the rural population displaced by the consolidation of holdings.

Will these conditions be fulfilled in a country like ours? Can we, for instance, consolidate our infinitely small holdings, and if so with what result?

Consolidation of Holdings

Consolidation of holdings as a remedy against our inefficient methods of cultivation has been advocated in many quarters. It is argued that if the small holdings are consolidated into large compact economic holdings of, say, 20 to 30 acres, an increase in production will follow, and our agrarian and food problems will be solved.

Such an assumption does not clear one thing. Among whom are the large holdings to be distributed? Who are going to be our future cultivators after the consolidation has taken place? Are the new holdings to be distributed among some of the present cultivators or, are we going to find a new class of landholders for these enlarged holdings as in England or even Germany and France? We shall try to discuss the possibilities.

Let us first take our present cultivators. Will an enlargement of holdings in their case mean more efficient methods of production and an increase in output?

Such an expectation belies the historical facts which we have already discussed. Had there been any possibility of the small farmer himself assuming the charge of an enlarged farm, England would not have needed the newly enriched burghers to bring about the agrarian revolution, nor would Germany and France have delayed to imitate England.

It was precisely because the small farmer, with his ancient system of production in which manual labour rather than capital predominated, was unable to take charge of the extensive farms which could be efficiently cultivated only under the revolutionised process, which involved the predominance of capital rather than manual labour, that the rich burgher, a typical product of the Industrial Revolution, stepped in.

Leaving the facts of history aside, and coming to the present state of affairs in India, we find that such an expectation is not likely to be realised in the case of this country. The Indian peasant with his uneconomic holdings seems to be the last person to be able to undertake such work. So small are his resources that he is often forced to consume his manuring capital, which if used otherwise, would bring him increased returns from land. It is not ignorance that drives him to do this but dire necessity. The result is that he cannot cultivate even his small holding with efficiency, under the existing method of production which he carries on with a small amount of capital. What can he then do with enlarged holdings when he has not sufficient capital to manage even his small holdings with any degree of efficiency? Such a change would only mean smaller returns from land, for we cannot expect him to equip his enlarged farm with modern appliances and fertilisers, which must involve a large capital expenditure beyond his capacity. To sum up, at present the existing holdings themselves are too large for the peasant with his

small capital resources.¹ How then can we expect him to undertake the tillage of still bigger ones?

The second alternative, if feasible, would go a long way to bring about the required revolution in agriculture, but where are we going to find this class—the Indian prototype of the rich burgher of 19th century England? In England such a step was possible, because of her unique position with regard to the Industrial Revolution, but even France and Germany, two of the countries which were the first to follow England's lead in industrialization, could not repeat such a performance. Large estates, no doubt, were brought into existence, and farms were consolidated to some extent, but they could not think of a policy of wholesale consolidation and enclosures on the lines of England. They could not do this because deprived of the many advantages which accrue to a pioneer, their process of industrialization was comparatively slower than that of England, as also was the growth of a rich burgher class with sufficient initiative and enterprise to apply the industrial concepts to land. Such a class does not exist in India at present, and the few rich men in the towns are not interested in land beyond buying it, and securing a fixed amount of rent from it. Moreover, this class of people are not likely to furnish capital to any great extent to improve the land.

Can we expect a rapid growth of an enterprising class of people as in England in the near future, and a consequent growth of large scale farming? Such an expectation will again belie history. France and

¹ "Given this state of affairs, can we not say with more propriety that not only the existing equipment is inadequate for the enlarged holding, but that the existing holdings, small as they are, are too big for the available instruments of production other than land? Facts such as these, interpreted in the light of our theory, force upon us the conclusion that the existing holdings are uneconomic, not however in the sense that they are too small, but that they are too large." Ambedkar "Small holdings in India and their remedies," *Journal of the Indian Economic Society*, Vol. IX, Nos. 2 and 3.

Germany even in those years could not have a rapidly growing burgher class. How can we expect such a thing now, when competition has become keener, and more serious handicaps have been introduced in matters industrial? Any rapid growth of such a class seems to be out of question, and industrialization of Indian agriculture on English lines seems therefore quite impossible.

The Example of Germany and France

It may be argued that consolidation of holdings need not necessarily be in the form of very extensive farms as in England. What we should aim at is to give the farmer a sufficiently large holding, as in the case of Germany, to enable him to maintain himself. Here also we are confronted with great difficulties. Even if we were to parcel out our land only in economic holdings, the cultivator will still have to face the problem of tilling efficiently an enlarged holding, and in view of what has been said in the preceding pages, it is almost certain that he will not be able to rise to such an occasion, at least for some time to come. It should be remembered that such a redistribution of land will not be worth having unless in the first place provision is made for giving employment to the vast numbers that it will displace, and unless the tendency for the holdings to be sub-divided is stopped. As will be seen from the following chapter, none of these provisions can be realised unless the agricultural population is definitely reduced. This brings us to what happened in France under similar circumstances.

It must be understood at the outset that in spite of the progress of industrialization ever since the beginning of the last century, France is predominantly agricultural. France experienced no wave of enclosures like England while she was working out her industrial development. Consolidation and enclosures had, to some extent,

been going on for centuries, but the process of industrialization did not give a special stimulus to these. The result is that since the beginning of the 19th century the framework of rural France has not been altered materially, the small land-holder still persists and predominates with his small holdings.

The reasons of the success of the small farmer, so far as production was concerned, were very peculiar. The French peasant was not so much oppressed with poverty as his modern prototype in India. The very fact of the French Revolution and of the subsequent wars which followed, in which French peasantry stood out so powerfully against all other European nations, is an eloquent testimony to its vitality. This alone would not have assured France a prosperous peasantry for years to come, but for the operation of a far more important cause, and that was the foresight of the peasant as displayed in his determination not to allow too many children to be born. The slow growth of population which followed as a result of this, prevented any further sub-division of holdings,¹ and this enabled the French farmer to adopt more efficient methods of production. Besides, this slowly growing population was not absorbed by agriculture, but an outlet was provided for it by the steady growth of industries. But for this, France would have had to face poverty and ruin, and sink to the level of a country like India, with agriculture, the main industry, extremely overcrowded.

It may be observed in this connection that the very fact that such foresight was exercised in France, assumes an economic and social condition of the French peasantry,

¹ "The slow growth of population, and its actual decline on the land, have prevented any conspicuous increase in the sub-division of the holdings. It could in fact be said with almost absolute truth that population has not grown in order that holdings might not be sub-divided, some of the districts where the fairly prosperous peasant owner or the comfortable farmer predominates being those in which birth rate is the lowest".—Economic Development of France and Germany—Clapham, p. 160.

entirely different from what we find here. Where there is complete poverty and a blighted outlook on life, no restraint is practised. Where there is any hope of gaining by restraint, it is sure to appeal to the minds of the people. From this point of view the restraint as practised by the French peasant was an index of his healthy sense of responsibility rather than of his decadence.

Conclusion

Coming then to India, we find tendencies quite in the opposite direction. The day when the Indian farmer should have practised restraint is long past. Sub-division of land is going on at a rapid rate. Uneconomic holdings are gaining the upper hand, and more and more men are day by day forced to subsist on them. The decadence of the peasantry is increasing and where it will lead to nobody can tell. Under such circumstances can we talk of increasing our production without the adoption of the only remedy that France has resorted to. If we adopt this remedy we shall have to do so with greater intensity, because France had already anticipated things, and did not allow agriculture to become overcrowded. We have allowed things to drift and find our agricultural industry overcrowded to an extreme point. Every increase in population has hitherto mostly been absorbed by agriculture rather than industry, and unlike France the agricultural population has been increasing. We have to undo the effects of all this, and entirely remodel our whole economic structure, if any change in our methods of production is to be brought about.

CHAPTER XI.

INDUSTRIALISATION AS A SOLVENT OF THE AGRARIAN PROBLEM

It is argued that the present chaotic condition of agriculture in India, as characterized by an extreme sub-division of holdings and a low yield per acre, can be easily remedied by transferring the surplus population from land to urban centres, by means of a rapid process of industrialisation. This lifting of the agricultural pressure, it is stated, will make for more efficient cultivation, and will easily solve the food-problem of India. Nay, it is maintained that such a process will allow an increase in population to take place without causing an additional pressure on land. Analogies are drawn from the economic history of Germany and Britain to point out the possibilities of a huge population being absorbed by a growth of modern industries, and the rapid growth of population in these countries, consequent on their industrial development is made the basis of an argument for a similar possible increase in our population, only if industries develop.

It is further believed that such an industrial transition or revolution can be easily achieved, for, it is argued, did not Germany become industrialised within a short period of 40 years? Was not the transformation achieved with amazing quickness in England? What can then hinder India from following in the footsteps of Germany or England? Besides, have we not got the treasures of raw materials at our door, which advantage neither Germany nor England possessed? Have we not got in abundance coal and iron, and other requisites for an

industrial development, commensurate with our needs and desires? Why allow the foreigner to use our raw materials instead of utilizing them ourselves? Why allow our latent wealth to lie in idleness instead of working it up for the benefit of an increasing population? In short, it is believed that like Midas, we have only to touch our resources actual as well as potential, and they will be immediately converted into gold.

We shall try to examine the above argument in this chapter. In doing so we shall first gauge the relief that has been given to our agriculture by the industrial development that has taken place so far. We shall then consider the nature of the industrial development in foreign countries, and the relief that it gave to their agriculture, and then estimate the extent of the burden on land in this country which must be removed if it is to get any relief. We shall further examine the possibilities of a rapid progress of industrialization, of the type of Germany or England, to be able to obtain the required relief. Finally, we shall discuss the factors limiting the development of industries in modern India, and the possibilities of their removal, with the present overgrowth of agricultural population.

We shall first take the progress that industrialization has made in this country. It is not necessary to consider all industries,¹ but only a few typical ones such as the textile industries of cotton and jute, and the coal industry. We shall examine the nature of their progress, which will give us sufficient material to know the tendencies in the growth of Indian industries.

Cotton Industry

The cotton industry is by far the most important industry not only because of its extent and output, but also

¹ For a fuller account of Industries in India see the volume on "Trade and Industries" in this series.

because it is mainly carried on by indigenous capital, and indigenous organization, and because it was the first Indian venture in modern methods of large-scale production. If there is any industry which can typify the progress that industrialization has made in India, and also testify to the ability of Indians for organization and to some extent to their capital resources, it is the cotton industry.

Though three-fourths of the total number of cotton mills in India are situated in the Bombay Presidency, and a majority of these in Bombay itself, the first cotton mill in India was started near Calcutta in 1838. It was fully fifteen years after this that in 1853 Bombay first saw the erection of a cotton mill of the modern type. The progress which the industry has made since 1879-80 can be seen from the following table :—

Year	Number of mills in existence	Persons employed in thousands	Looms thousands	Spindles thousands
1879-80	58	40	13	147
1888-89	109	92	22	2670
1898-99	174	156	37	4463
1908-09	283	237	75	5967
1913-14	264	261	97	6621
1918-19	264	290	116	5591
1928-29	335 ¹	360	166	8704

The slow, though steady nature of the progress of this industry is obvious. The development of the industry was somewhat rapid at the beginning. During 1880 and 1889 the number of mills was nearly doubled, while the number of persons employed in the industry in 1889 was nearly $2\frac{1}{2}$ times that in 1880. The growth was also rapid

¹ This includes 20 mills which were in the course of erection.

during 1888-98 and 1898-1908, but thenceforward showed a definite tendency to slow down especially after 1915-16. The number of men employed in the industry also showed a continuous increase, at times rapid, at times slow.

In the early days the industry was chiefly concerned with the production of lower counts of yarn, and it found a ready market in China, and also in the indigenous weaver. This explains the comparatively rapid growth of the spindles compared with that of the looms. The tendency in recent years, however, has been to spin higher counts. During the War there was a remarkable rise in the production of counts above 20, especially in counts above 40. Since the Armistice, however, there has been a substantial decline in the production of counts above 40, the total for 1922-23 being 22 lakhs of lbs. as compared with 48 lakhs of lbs. in 1918-19.

The industry has, however, not yet been able to capture the home market. Imports still form a considerable proportion of the total quantity of cloth consumed in India ; but there has been a tendency for the imports to be displaced by indigenous manufactures since the beginning of the war in 1914. The following table will bear out the above statement :—

*Indian Imports, Production and Consumption of
Mill-made Cotton Cloth¹*

(In Crores of Yards)

Fiscal year ending March 31	Imports	Production of Indian Mills	Consumption of mill-made goods
1910	219	96	301
1911	231	104	318
1912	244	114	342
1913	302	122	409
1914	320	116	421
1915	245	114	348
1916	215	144	344
1917	193	158	315
1918	156	161	290
1919	111	145	231
1920	108	164	243
1921	151	158	288
1922	109	173	259
1923	159	172	309
1924	149	170	296
1925	182	197	356
1926	156	195	332

Nearly one-tenth of the total output of Indian mills is exported, while between two and six per cent. of the imports are re-exported. The home market, therefore, consumes a larger proportion of foreign goods than the above figures seem to indicate.

It is then in the direction of capturing the home market that the future prospects of the industry lie. The tendency has already begun. How long it will take to oust the foreigner completely, cannot be ascertained. Whether the tendency is merely a temporary phenomenon or

¹ International Cotton Bulletin, January 1927, page 252.

a more or less permanent one cannot be said. It is clear, however, that the slow growth of the industry does not seem to suggest any rapid progress towards driving out the foreigner. It is interesting in this connection to note that during war time, when foreign imports were reduced, the Indian industry was unable to cope with the demand in India. At no other time was our dependence on foreign mills brought so completely home to us than during war-years, when prices of cloth rose to giddy heights, and caused great hardship to the poorer sections of the people. The wide discrepancy between the demand for cloth and the supply of it from the Indian mills, was due to a want of additional machinery which could not be had owing to the war.

There is yet another sphere for the cotton industry in the home market, and that is that part of the demand which is supplied by the Indian hand-loom. How large a part is played by the Indian hand-loom in supplying the Indian demand for cloth can be seen from the following table :—

	Average of 1896-97—1901-02	Average of 1908-09—1913-14	Average of 1917-18—1922-23
	(In Thousands of lbs.)		
Net quantity of yarn available in India	30,09,49	47,49,25	59,51,59
Yarn consumed in Indian Mills . .	8,81,51	22,22,48	34,09,87
Yarn (mill made) available for hand- loom weavers . .	21,27,98	25,26,77	25,42,22

Whether the Indian mill industry will be able to oust the weaver in the near future is an important question, for the varied demand for which the Indian weaver caters

may not be a suitable market for the cotton industry with its large scale methods of production. But any deflection of the industry in this direction is likely to be attended by serious results, depriving the weavers of their employment, unless a provision for their absorption in other industrial concerns is simultaneously made. The cotton industry itself will be unable to give employment to more than a limited number of men, since machinery means economy of labour.

The facts briefly outlined above show that though the cotton industry has been in existence for a long period, it has not yet been able to capture the home market. Besides, there are no indications to show that there will be a rapid development in the future. In fact, the industry is passing through a period of severe depression and crisis at present, so much so that its maintenance at its present strength is a problem beset with difficulties. The mild measures suggested by the Cotton Tariff Board of 1927 have not resulted in any substantial good, and the industry is now crying for protection.¹

Jute Industry

We now turn to the other important textile industry namely jute. Unlike the cotton industry the jute industry is mostly managed by foreigners though the majority of the shares are now held by Indians. Jute being a monopoly of India the progress of this industry has been uninterrupted. Starting in 1855, when the first power mill to spin jute was erected, the industry has progressed steadily, as shown below.

¹ Along with the budget of 1930-31, protective measures in favour of the cotton industry have been taken. The revenue duty on cotton goods has been raised to 15 p.c., with an additional protective duty of 5 p.c. on non-British goods, with the exception of plain grey goods, which will have to pay a minimum duty of 3½ as. per lb.

* Years	No. of mills at work	Number (in thousands) of persons employed
1879-84 . . .	21	388
1888-94 . . .	26	643
1899-1904 . . .	36	1142
1909-14 . . .	60	2084
1914-15 . . .	70	2383
1918-19 . . .	76	2755
1922-23 . . .	86	3212
1926-27 . . .	93	3336

The somewhat rapid development during recent years, especially after 1914, is a remarkable feature of the growth of this industry. The number of mills in 1922-23 was more than three times the average for 1888-1894, while the number of men employed was five times. The war gave a special impetus to the industry, and progress during and after the war has been rapid. The reason for this rapid expansion is obviously the Indian monopoly of jute.

There is still further scope for the expansion of this industry, for the whole of the raw jute is not consumed by Indian mills.¹ In 1926-27 about 40 lakhs of bales were exported.

¹ Mill consumption and exports of raw jute.

Period. Season ending June 13th	Mill consumption 1000 bales	Export 1000 bales
1914	44.99	43.10
1915	49.44	30.46
1916	57.70	31.57
1917	56.78	28.40
1918	54.47	17.56
1919	51.39	22.10
1920	52.27	34.00
1921	56.23	23.36
1922	43.58	29.79
1926	55.27	40.00

It will be seen from the table given above that the quantity of raw jute exported in 1914 was slightly less than that consumed by Indian mills. By 1922-23 it had fallen to two-thirds of the local consumption. This tendency seems to continue, and this shows that the industry has scope for further expansion even if the production of raw jute remains at the present level.

Coal Industry

The record of the coal industry is one of continuous progress. The average output of coal for the quinquennium 1901-05 was 76 lakhs of tons, while that for the following quinquennium was 115 lakhs. During 1911-15 the average output increased to 154 lakhs, and during 1916-20 to 193 lakhs. The production in 1924-25 was about 210 lakhs of tons. The number of men engaged in this industry was 1,07,272 in 1917, while in 1923 it was 2,00,913.¹

The causes of the remarkable development of the coal mining industry in recent times are not far to seek. The rapid development of the Indian Railways, and the steady growth of the mill industries largely contributed to this result. The increase in production was also due to the use of improved machinery. During 1895 to 1908 Indian coal practically captured the whole of the home market.

In spite of this progress, the Coal Industry is suffering from some peculiar difficulties. The production is now in excess of home demand, and it is difficult for Indian coal to compete in foreign markets. South African coal, which competes with our coal abroad, is also imported in certain quantities in Bombay, and this adds to the difficulties of our industry.

¹ For a fuller account of the Coal Industry, see the volume on "Trade and Industry" in this series.

The Nature of Industrial Progress

We have now briefly surveyed the development of some of the important industries in this country. We have found nothing striking or phenomenal in their progress. The cotton industry which easily comes first in India has been dependent on foreign markets which have been shrinking of late. Till recently, the industry has given far more attention to the production of yarn rather than of woven goods. A large part of the home market has been left to others, and the prospects of capturing it seem to be remote, inasmuch as it involves the spinning of higher counts in which the competition from Lancashire is very keen. The jute industry though showing a somewhat rapid progress, has as yet failed to consume the whole of the raw material produced here. The causes of the rapid development of the coal industry are not likely to persist in the near future, and difficulties are already ahead. The iron and steel industry is of quite recent origin and we cannot build great hopes on it for the present.

On the whole, therefore, it may be summarised that the progress of industrialisation in India has been very slow. At the most it has touched only a few industries, and the development in them is neither phenomenal nor striking. The slow nature of the development will be further realized, if we remember the fact that many important industries have as yet not been started, whereas some have been only recently commenced, like the basic industry of iron and steel. It is interesting to note in this connection that even the beginnings of an industry for manufacturing machinery have not as yet been made. If such a state of affairs continues, our industrial progress in the future will be determined by the willingness or otherwise of foreign countries to sell machinery to us.

Such a development can in no way be compared with

what took place in England after 1770, or in Germany after 1850. In these countries industrialisation did not mean the slow growth of a few industries, but it touched every sphere of production, and brought about a rapid progress in all directions. To take the case of Germany for instance, her huge output of crude iron provided a basis for building up a number of metallurgical industries. Simultaneously she developed her textile and chemical industries with amazing rapidity. If Germany increased her output of pig iron from 27,29,000 tons in 1880 to 1,47,94,000 in 1910, and of steel from 15,48,000 to 1,31,49,000 tons, she also increased the output of crude potassium salts from 2000 tons in 1861 to 96,07,000 tons in 1911; and she also made remarkable progress in many other industries.

The Relief to Agriculture Given by Industrial Progress in India

Turning from the fact of this slow development of industries we come to the relief granted by them to the overcrowded agriculture of this country. Those who advocate industrialisation have in their mind the great rural exodus effected by it in England and Germany. As we have seen, industrial development in this country cannot even be compared with what took place in the two European countries. We should not, therefore, be surprised if there is a slow rate of rural exodus. But the figures as given in the various census reports reveal an astonishing tale.

*Tables showing Distribution of Population
between Agriculture and Industry*

Table A.

Class	Population in thousands 1891	Population in thousands 1901	Percentage variation— increase [+] or decrease [—]
All occupations	2,87,223	2,94,186	2
Pasture and agriculture .	1,75,381	1,95,668	12
Preparation and supply of material substances .	48,631	45,677	—6
Commerce, transport and storage	8,681	7,679	—11

Table B.

Class	Population in thousands 1901	Population in thousands 1911	Percentage variation— increase (+) or decrease (—)
Total population. .	2,85,398	3,04,233	6·6
(A) Production of raw materials, exploi- tation of the sur- face of the earth (agriculture, etc.) .	1,91,910	2,20,160	14·7
Extraction of miner- als	234	517	120·3
Preparation and sup- ply of material sub- stances	55,890	56,354	·8
Industry	34,296	34,245	—·7
Transport	3,769	4,877	29·4
Trade	17,824	17,230	—3·8

Table C.

Class	Population in thousands	Population in thousands	Percentage variation— increase (+) or decrease (—)
	1911	1921	
Total Population. . .	3,13,470	3,16,055	0·8
Production of raw materials . . .	2,27,080	2,31,194	1·8
(1) Exploitation of animals and vege- tation (including pasture and agri- culture, etc. . .	2,26,650	2,30,652	1·8
(2) Exploitation of minerals. . . .	529	542	2·3
(B) Preparation and supply of material substances . . .	58,106	55,612	—4·3
Industry	35,320	33,167	—6·0
Transport	5,028	4,331	—13·8
Trade	17,756	18,111	2·0

It will be seen from the above figures that instead of there being a rural exodus consequent on the growth of industries, there has been a consistent process of ruralisation since 1891. The pressure on land instead of being lessened has increased. The proportion of those supported by agriculture to the total population was 61·1 per cent. in 1891; it increased to 66·5 in 1901; it rose to 72·27 per cent. in 1911; while in 1921 it further increased to 72·98.

It is also interesting to note that every census shows a more rapid increase in the agricultural than in the total population. Thus, during 1891-1901 the total population

increased by 2 per cent., while the agricultural population increased by 12 per cent. During 1901-11 the corresponding rates of increase were 6.6 and 14.7, while during 1911-21 they were .8 and 1.8 respectively.

The figures relating to industry show a consistent decline, the decrease being 6 per cent. during 1891-1901, 7 per cent. during 1901-11, and 6 per cent. again during 1911-21. Trade and transport, occupations allied with industry, also show a decrease of 11 per cent. during 1891-1901; in the following decade transport shows an increase of 29.4 per cent., but trade shows a decrease of 3.3 per cent. During 1911-21 the positions are reversed, and it is now trade that shows an increase while transport declines.

The significance of these figures is unmistakable. The process of industrial development has failed to provide any outlet for our overgrown agricultural population. Far from affording any relief to agriculture, it has aggravated the evils of land pressure. Having caused the decline of many of the indigenous industries in conjunction with the imports of manufactured goods, it has been unable to absorb the displaced population. Some absorption has, of course, been going on but the rate is very slow. The result has been a continuous process of ruralisation, a constantly increasing pressure on the land which does not show any sign of abating. In course of time, agriculture will become overcrowded to such a ruinous extent that progress in industrialization itself may be threatened. How can we expect any relief to agriculture under these circumstances? So far as we can see, a slow progress of this kind will only mean a growing population trying to eke out a miserable existence from poorly cultivated land.

Can we not generalise on the strength of these facts, that if by industrial development we mean the type of slow progress that we are having at present, our agrarian

problem will not be solved? This is so, because the growth of population on land will, in the meanwhile, be creating new problems, and putting greater difficulties in the way of remedying the great evil of land pressure. Under such circumstances, the tendency for the holdings to be sub-divided will remain unchecked, and agriculture, which is already overcrowded, will become overcrowded to a still greater extent. This may even hamper our industrial progress itself, for, our industries and our industrial population will have to depend on the home producer for the required raw materials and food-supply. Besides, we have seen that however small an increase there might be in the agricultural population, it will result in more inefficient methods of production, and therefore a more precarious food-supply. If this is the case, then our future industries will run the risk of being seriously disorganized by a shortage of food-supply as well as of raw materials.

There is yet another danger to our industries if even a slow growth of population takes place side by side with a slow process of industrialisation. Our future industries will have to depend mostly on the home market for disposing of their produce. Any increase of population, under such circumstances, will mean a dependence of our industries on a hypersensitive market—a market from which the demand for manufactures may be partially or even entirely cut off by the least adverse change in the economic environment. Likely to be deprived of his purchasing power at any moment, the future Indian cultivator, who still bulks large in the population of the country, will not provide a steady market for our industries. The fluctuations thus produced will embarrass the manufacturer and disorganise production.

It is then clear from the above that if industrialisation is to solve the great problem of land pressure in this country, its movement must be a very rapid one. How

rapid it should be will be determined by the extent of the surplus population on the land. In this connection it should be remembered that the industrial progress in European countries has proved a boon to their economic life, by providing relief to the overcrowded agricultural industry in those countries.¹

The question then is, what relief do we require from our industries to establish our agriculture on a sound basis? As we have seen, agriculture is overcrowded to such an extent in India that it has ceased to be profitable ; the sub-division of holdings has been carried on to the lowest point imaginable, and the tendency still shows no signs of abating. The population living on the land is far in excess of the number required for efficient cultivation, and consequently, if the land were to be redistributed after consolidation into economic holdings of 20 to 30 acres each, an enormous number of people would be displaced, and would have to starve if there were no other occupation. How large such a number would be cannot be stated in exact terms. But its extent can be easily judged if we bear in mind that this exodus to land ; this overcrowding of agriculture, has been going on ever since the beginning of the industrial era in England, and long before even a slow growth of modern industries was dreamt of in India. We have in consequence the peculiar spectacle of having only one aspect of industrialisation, namely the displacement of population, without the redeeming feature of its absorption. The recent steady growth of our industries has only aggravated the situation. We find in consequence that this surplus population, which has been accumulating on the land for more than a century, is huge. The problem, therefore, is, can we rely on our present slow industrial progress to absorb this agricultural surplus in industries?

¹ cf. *Economic Development of France and Germany*, by Chapman.

Extent of Agricultural Surplus

We have seen that in 1921 the population supported by land was 72·98 per cent. while that supported by industry was 10·49 per cent. of the total. These figures understate the real state of affairs in the first case, and unduly exaggerate it in the second. The latter gives a wrong impression of the relief that has been granted so far by the growth of modern industries. It will be worth while, therefore, to reproduce the figures given in the Census Report, and analyse them.

Occupational sub-class	Percentage of total population
1. Pasture, agriculture and hunting .	72·98
2. Mines and minerals	0·17
3. Industry	10·49
4. Transport	1·37
5. Trade	5·73
6. Public force	·69
7. Public administration	·89
8. Professional and liberal arts . . .	1·59
9. Independent income	0·15
10. Domestic service	1·44
11. Unclassified	3·51
12. Unproductive	1·04

To analyse these figures, we shall begin with the second sub-class, mines and minerals. The population supported by this occupation is only ·17 per cent. of the total. But even this percentage, small as it is, exaggerates the total number supported by the mines. The coal miner is mainly an agriculturist who works in the collieries to supplement his small agricultural income.¹

¹ "It is a well known statement that the coal-miner is an agriculturist who turns to coal mining when the force of circumstances drives him to seek some means of subsistence other than the fields. In July and

The figures under "Industry" show that 10.49 per cent. of the total population derives its livelihood from this source. But we cannot take this figure as an indication of the percentage absorbed by modern industries, for only one per cent. of the total population is engaged in large organized industries. The remaining nine per cent. are engaged in small unorganized industries carried on with simple implements, and catering to personal and household necessities.¹

Besides, the nine per cent. employed in unorganized industries are not wholly dependent on these occupations for their livelihood. A considerable number of these try only to supplement their agricultural income from this source.² A large proportion of the population shown as engaged in industry is, therefore, also dependent on land for its livelihood.

The other sub-classes, with the exception of the sub-class 'unclassified,' may be said to have no connection with agriculture; but a considerable proportion of the population entered under the sub-head "unclassified" are possibly labourers connected with land.³

This analysis clearly shows that nearly 85 per cent. of the population is, in some way or other, connected with land. In order to appreciate the nature of the overcrowding on land the following figures will be useful. According to the 1921 Census, the number of actual workers on

August when the paddy is being transplanted and in November when it is being cut, the mines are almost invariably working short-handed. Anything in the nature of scarcity in the neighbouring districts is a blessing to the coal-field", Bihar and Orissa Census Report, 1921.

¹ All India Census Report, p. 241.

² "The principal cottage industries, such as textiles and pottery, are largely combined with agriculture and general labour, but the Census Reports are not sufficiently complete, or trustworthy to give us clearly the figures of subsidiary industrial occupations". Ibid, p. 250.

³ ".....a considerable proportion of the unfortunately large number of persons in the category of vague and unclassifiable occupations are probably labourers closely connected with the occupations of the land." Ibid. p. 241.

land, that is, ordinary cultivators, farm servants, field labourers and growers of special products was 9,77,90,515 for the whole of India. Deducting the number in the Indian States, which is about 199 lakhs, we get 7,78,90,515 as the number of actual workers on land in British India. The total area sown with crops was 22,28,25,487 acres in 1921 in British India. This gives an average of 2.9 acres per worker. In foreign countries the proportion of land per agricultural worker is much higher. In England and Wales, according to the Census of 1911, there were 21 acres per worker. In the Western states of America, and in Argentine the acreage per worker is very much greater than in England. In South Africa it is as much as 83 acres per actual worker.¹

These comparisons, however, fail to convey the magnitude of the surplus population on land which has to be relieved. Before trying to estimate this, we must be clear as to where we should draw the demarcation line between a surplus population and a necessary one. The extent of the surplus will vary with the different ideals adopted for the peasantry. If the farmer is simply to be regarded as a beast of burden who must toil, then the present agricultural population may be regarded as an ideal one. If the ideal adopted is one of providing the peasant with only the necessities of life, then the extent of the surplus will be smaller than if the ideal were that of providing the cultivator with a comfortable means of living. We shall,

¹ It may be argued, however, that the comparison between India and foreign countries as regards land per worker is a fallacious one, inasmuch as it is only the use of agricultural machinery that enables the foreign worker to manage so much land and that as machinery is not in great use in India, we are likely to require proportionately more workers for every fixed unit of land. But even if we compare India with England in 1851 when little machinery was used in agriculture, we still find a great disparity. In England there were 17 acres for every worker in those days that is, nearly 6 times more than in India at present.

however, be satisfied with the former, and consider any excess of population on the land, above the point at which it gets only sufficient to maintain itself, as a surplus. In short, the maximum population that can depend on land should be that which assures at least an economic holding to the farmer.

Having thus drawn a line of distinction between a necessary and surplus population, we shall now proceed to ascertain the size of an 'economic holding'. Various estimates as regards this have been made and they show wide discrepancies. Thus Mr. Keatinge in his "Rural Economy in the Bombay Deccan" gives an economic holding as consisting of "40 or 50 acres of fair land in one block". Dr. Mann describes an economic holding as one of 20 acres.¹ According to the Baroda Committee of 1918 such a holding should consist of between 30 to 50 bighas, that is, between 25 to 42 acres. Professor Jevons, speaking in 1917 at the annual meeting of the Board of Agriculture, said that a holding to be economic should consist of about 15 to 20 acres. The lowest limit of an economic holding as estimated by experts seems to be 15 acres, and if we proceed to calculate the surplus on this basis, we shall err on the safe side.

It may be argued, however, that an economic holding is a changeable unit, varying with the fertility of the soil and the climate, and that there cannot be one standard for the whole of India. This argument is certainly valid ; but the error that will enter into our calculation by adopting such an average standard will not be great, and the general conclusion will therefore be substantially correct.

Turning to the calculation of the surplus, we assume that if such a type of holding is brought into existence over the whole of India, it will provide full employment for a farmer with an average family of four or five persons, and partial and occasional employment for a labourer or

¹Land and Labour in a Deccan Village by Dr. Mann.

two. Taking the number of actual workers in an average family as three, we may conclude that a holding of 15 acres will give employment to three persons at the most. Under such a system of land-division, therefore, there will be five acres for every actual worker on land. The total area under cultivation in British India was 22,28,25,487¹ acres in 1921. The total number of workers that can be supported on this area will therefore be 4,45,65,097. The total number of workers on land was, however, 10,17,85,489² for the whole of India. Making allowance for the States, the number of workers in British India comes to about 810 lakhs.³ This means that according to our calculation there were as many as 36,434,903 surplus workers on land in 1921. In British India alone, therefore, as much as 44 per cent. of the total workers on land were superfluous.

The above figure gives only the surplus number of real workers on land. It by no means indicates the real extent of the pressure of population on land, because for every superfluous worker, there are some dependents and these must be taken into account. Calculating on the proportion of the total number of workers to total agricultural population in India, as revealed by the last Census, we find that on the basis of the above figure of 3,64,34,903 surplus workers in 1921, there was a surplus agricultural population of nearly 710 lakhs in British India. This is 39 per cent. of the population living on the land, and 29 per cent. of the total population. A superfluity of 44 per cent. of the active workers on land, or of 39 per cent. of the population dependent on agriculture, which is equal

¹ The Statistical Abstract for British India 1914-15 to 1923-24.

² Ibid.

³ The Statistical Abstract for British India does not give the number of actual workers on land separately for British India and States. The above figure giving the number of workers in British India is based on our own calculation made by dividing the product of total number of workers and population in British India by total population in India.

to 29 per cent. of the total population, is an eloquent testimony to the extent of overpopulation in this country and of the consequent pressure on the soil.

Even these figures, imposing as they seem, do not furnish the whole number to be absorbed by a growth of new industries. As we have seen, by far the greatest portion of the population returned as engaged in industries in the Census of 1921, is dependent partially on agriculture and unorganized industries. In fact, organized industries engage only one per cent. of the population of this country. With the development of modern industries which will complete the ruin of Indian handicrafts, this portion of the population will be entirely thrown on the land to create new problems of land pressure, unless absorbed by the new industries. The population, an outlet for which must be thus provided for, works out at about 225 lakhs in British India alone. We must add this number to the 710 lakhs of people who are in excess on the land; and we thus arrive at the number to be relieved by industrialisation, which is 935 lakhs or nearly 32 per cent. of the total population of British India.

The Nature of the Industrial Problem

The Herculean task involved in an industrial revolution in India can now be realised. Those who talk lightly of relieving agriculture of its heavy burdens by means of an intensive and wholesale policy of industrialization, fail to comprehend the heavy task that is demanded of such a process in India. A population greater than the total population of Germany or of Great Britain, has to be absorbed in modern industries. Can we expect this to be done in the near future? It must be remembered too that this surplus population must be absorbed with great rapidity, otherwise even a slow growth of population in the meanwhile, will increase the pressure on land, and will thus tend to widen the margin to be relieved. It will be

easily seen from the above that no slow process of industrial evolution of the type we are having in India will ever be able to solve the problem. Will then a comparatively rapid industrial revolution of the type of Germany and Great Britain be able to relieve agriculture of its heavy burden?

Before turning to answer this question one argument has to be met. It may be said that there is no necessity for diverting the whole of this surplus to industries. Why not extend cultivation and keep a large part of this overgrowth, on land itself? The argument seems weighty,* especially in view of the large extent of land yet available for cultivation, which is estimated at more than 10 crores of acres. But as we have shown in the preceding chapter, the mere fact that there is much land yet available, does not necessarily mean that it will be taken up for cultivation. Extension of cultivation is determined by economic factors and conditions, and as we have seen in the preceding chapter, it has of late shown a tendency to increase at a slower rate.

Even if we assume that all the land available for cultivation is brought under the plough, there will be a surplus of 495 lakhs of people on the basis of a 5 acre unit for each active worker. Even on this very safe assumption agriculture remains overcrowded, and the problem of providing industrial work for a large population remains to be solved.

Turning to the question whether an industrial development of the type of Germany will be able to administer the much needed relief to our agriculture within a reasonable period of time, we find that such an expectation is not likely to be realised. Germany with her astounding progress of industrial development made possible by her vast capital resources and extensive markets, could absorb only 389 lakhs of her population in industries in sixty years. This as we have seen is far below our require-

ments, for we have a surplus population of nearly 935 lakhs to be relieved, and even if our population were to remain stationary for sixty years to come this would still leave a surplus of 540 lakhs. Even if a slow growth of population is taken for granted in the meanwhile, the day when agriculture will be relieved of its burden goes beyond the bounds of any reasonable length of time. If we confine our attention only to the agricultural population of India and assume a rate of increase equal to that in the last decade, which has been the lowest on record, we find that sixty years of rapid industrialisation of the German type will be too short a period to effect any material change in the condition of Indian agriculture. This is so because by the time that such a development shall have relieved agriculture of about 390 lakhs of its surplus population, the agricultural population will have grown by 166 lakhs, and the number to be drained away from agriculture will have increased to 700 lakhs. This will mean another sixty years of rapid industrial expansion, and whether we shall ever be able to sustain this rapidity for so long a period is a moot point. It may be added that Germany herself found that she could not maintain the rapidity of her progress after 60 years.

It will easily be seen from the above that even if the remarkable development of industries which was witnessed in Germany or England, were to be repeated in this country, the agrarian problem would still remain unsolved. Astounding as was the progress of both England and Germany, the number that they could absorb in industries is not inspiring for the problem before us.

It may be argued, however, that there is no reason why we should not think of a progress far more rapid than that which took place either in Germany or England. If Germany could absorb in industries as many as 389 lakhs within sixty years, why should not India, eight times as large as Germany, be able to accommodate a far greater

number? At least why should we not be able to absorb in industries the same percentage of population as Germany? Those who draw analogies from industrial Germany and England to point to industrialisation as a solvent of the agrarian problem, have in their minds, not so much the number of persons, as the percentage of total population absorbed by industries, and they believe that industries in India can be expanded sufficiently to allow the same percentage of total population to be employed in them. In short, their argument is based on arithmetical calculations, and they say that if Germany's area is X and industrial population Y , and if India's area is $8X$ then India's industrial population can be easily developed into $8Y$. This argument brings us to the consideration of the forces that brought about the industrial development of Germany and England, and to the possibilities of such a rapid development taking place in India and acting as a relief to our agriculture. We shall first try to see whether even the industrial progress of England and Germany began suddenly, or whether there were factors which were gradually preparing the ground.

Factors making for a rapid Development of Industries in England and Germany

We find that even in England the modernisation of industry did not take place quickly. There was a long period of preparation behind the process known as the Industrial Revolution. The sudden development of English industries has blinded many people to the slow growth of the fundamental factors that caused it. It is generally assumed that the rapid change in the methods of production which took place in the middle of the eighteenth century in England, was mainly due to a series of inventions and discoveries that characterised the eventful century. Such a conception entirely ignores the very

factor but for which this great change would never have come over England. This factor was the slow accumulation of capital in England over a long series of years. It was only owing to this fact, that the new processes, which involved a vast amount of initial expenditure, could be adopted with the utmost ease in England. Discoveries were made even before this period, but they could not be taken advantage of because there was no reservoir to draw upon for the initial capital outlay to be made.¹ There were other factors also which considerably helped to hasten the remarkable transformation that came over England after the middle of the 18th century, such as the extension of markets and the institution of the Bank of England. Though these did play a very important part in shaping the course of events, it can be truly said that the dominating fact of the whole industrial movement from 1760 onwards was the vast capital resources of England. We shall, therefore, now turn to an exclusive consideration of the conditions that made these resources available.

The process of accumulating this capital was essentially a slow and gradual one. It dated as far back as the reign of Elizabeth, when the adventurous spirit shown by men like Raleigh, and the ambition of the English nation as a whole to develop into a maritime power, gave a great stimulus to her trade. The defeat of the Spanish Armada, and the subsequent events which gave England an unquestioned supremacy over the seas, which though often challenged was always maintained, and the expansion of colonial and overseas markets, resulted in an enormous increase in commerce and trade. This whole development extending over nearly two centuries meant increasing wealth to England to be utilized in extending industry, trade and commerce still further.

Whether even this process of wealth accumulation over

¹ cf. Cunningham, *Growth of English Industry and Commerce*, part II, p. 610.

two centuries, under peculiarly favourable circumstances, would have been sufficient to ensure the rapid progress of industries that was witnessed after 1750, is doubtful. About this time however, there came to the help of the English nation another favourable circumstance, which secured to her not only a vast market for disposing of her goods, but also a large reservoir from which capital could be drawn. This was the political conquest of India.

The results which followed the importation of the vast hoards of wealth from Bengal were simply remarkable. The series of discoveries which were made after 1760, that is, three years after the battle of Plassey was fought, could be quickly taken advantage of and the change to methods of large-scale production easily achieved.¹

To turn to the other nation which has achieved the glories of a swift process of industrialisation, we find that in Germany also the modernisation of industry proceeded at a slow pace in the beginning. Though between 1815-50 attempts were made, especially through direct government help, to build up capitalistic concerns of the modern type, industrial progress did not make much headway till the forties of the last century. Germany's vast resources in coal and iron were still unutilized. There were many reasons for this slow growth. Prominent among them was the scarcity of capital, due to its destruction in the wars that had been raging severely for many years, and

¹ "Plassey was fought in 1757, and probably nothing has ever equalled the rapidity of the change which followed. In 1760 the flying-shuttle appeared, and coal began to replace wood in smelting. In 1764 Hargreaves invented the spinning jenny, in 1779 Crompton contrived the mule, in 1785 Cartwright patented the power loom, and chief of all, in 1769 Watt manufactured the steam engine, the most perfect of all events of centralising energy. But, though these machines served as outlets for the accelerating movement of the time, they did not cause the acceleration. In themselves inventions are passive, many of the most important having lain dormant for centuries, waiting for a sufficient store of force to have accumulated to set them working. That store must always take the shape of money, and money not hoarded, but in motion." Brooks Adams, "The Law of Civilization and Decay," pp. 259-260.

that culminated in the battle of Waterloo. The process of accumulation of capital to be utilized for furthering the growth of industrialism was thus essentially a gradual one.

What happened after 1870 offers a remarkable contrast to what took place during the preceding period. Within forty years the whole change to modern methods of production was complete. This was because of the peculiar circumstances of this period. First, sufficient time had been allowed for the accumulation of capital requisite for industrial development. Second, the institution of a modern banking and financial system made it possible to utilize the available capital supply with greater economy and greater effect. Finally, and this was perhaps the most important cause, there was the victory of Germany over France in 1870 followed by a period of overseas expansion. The national victory of 1870 not only enhanced the prestige of political Germany, but it also accelerated the economic development of the new Empire, inasmuch as it made available great capital resources in the form of the indemnity paid by France.

It will be easily seen from the above that in the two countries where rapidity was the characteristic feature of industrial development, the dominating factor in the growth of modern methods of production was the amount of capital available. In this connection we must not also forget another important factor but for which capital would not have been used to nourish industries, namely, the availability of extensive markets. The primary condition for any amount of capital to be invested is that the investment must yield an adequate return, and this condition was easily satisfied by the vast markets that were ready to receive both German and English goods. An idea of the vastness of these markets can be easily had from the fact that England, even when she was being industrialised, was styled the 'workshop of the world'.

Possible Rapidity of Industrial Progress in India

We now turn to a discussion of the possibilities of effecting an industrial transformation at least as rapid as that of Germany or England. From what is said in the foregoing pages, it will be easily seen that such a discussion means an investigation into the two necessary requisites of industrial progress, namely, large capital resources, and extensive markets.

To take the former requisite first, we shall treat it under two sub-heads. First, there is the question as to whether there is sufficient capital at present in this country to bring about a rapid industrial development, and second, whether at least a slow process of capital accumulation has begun, just as it began in England two centuries before the Industrial Revolution, to forestall such a development in the future.

The first question can be easily answered by making a reference to the facts cited in preceding chapters. We have noted the tendency of famines, to take a heavier toll, and we have found that this is due to a want of resources on the part of the agriculturist who predominates the Indian population. We have found that the dearth of capital is so patent with this prepondering majority, that they have not sufficient means even to meet the demands of the primitive system of cultivation which they practise. We have also seen that the extreme subdivision of holdings beyond the economic point acts as a bar to any accumulation of capital. We have also observed that the checks normally prevalent in India and even epidemics to some extent, are due to the poverty of the Indian masses. When such is the economic condition of more than 70 per cent. of the total population, how can we expect an accumulation of capital commensurate with our industrial requirements? Nor can we argue that at least the population engaged in industries, trade

and commerce may be saving enough to meet the demand for new capital. As we have seen, industries trade and commerce taken together engage only an insignificant percentage of the population, and consequently, the accumulation made by this section of the population, however large, will fall far short of the quantity required. The post-war condition of Indian industries shows that the capital resources of this class are poor.

How little possibility there is of any accumulation of capital taking place in this country, can be easily gathered from our low national income. The significance of the low figure of national income in this country in this respect has already been referred to.

In view of the existence of famines and various other positive checks which are due to a want of resources on the part of the majority of the population in this country, and in view of the inefficient methods of cultivation which exist because of the farmer's poverty, we conclude that we have not sufficient capital to meet even a small part of the vast amount required for any rapid development of industries. In this connection, it is surprising when we are told "that there is sufficient potential capital in India to meet the large part of India's industrial requirements, but that it is timid, conservative, and requires to be drawn out."¹ The only thing that we can say against this opinion of the External Capital Committee, is that the Committee made no estimates of the probable amount of capital required; and it had no conception of the extent and rapidity of industrial development required to solve the economic problem in this country.

The truth of this criticism will be borne out further, if we take into account the fact, that large amounts of resources have to be sent abroad every year in the form of "English Charges", which if retained in the country

¹ Report of the External Capital Committee.

would substantially increase her meagre capital resources.¹

Turning to the second requisite of a rapid industrial development, namely, an access to wide and extensive markets, we find that it has been argued by many men in this country that at least in this respect we are far better situated than either Germany or England, inasmuch as we have an immense home market of our own. It will perhaps come as a surprise to these people to be told that we have not more but less extensive markets than Germany or England. If we can hope to have a sub-continent like India for our market, we must remember that Germany and England had practically the whole world as theirs. Their markets not only include India but many other countries. Besides, it cannot be argued that we can also extend our markets in the same way. Even the boldest advocates of industrialisation do not dream of such a possibility for India for many years to come.

At the same time, one may also question whether the home market is as big as it appears to be. When people say that we have a vast market of our own to permit of very rapid development of industries, they have in their minds the 32 crores of people in this country. It should, however, be remembered that the extent of a market is determined by the purchasing power of the people who constitute it, and not only by their number. From this point of view we have still less reason to be satisfied with the width of the home market. The Indian cultivator, who will continue to bulk large in the population of this country has not sufficient resources to maintain himself, much less to buy manufactured articles and provide a ready market to new industries. It will thus be seen that industrial progress itself will be to a certain extent determined by the condition of the cultivator in this country. Make him more prosperous,

1 cf. C. N. Vakil—"Financial Developments in Modern India", Ch. XI.

make him richer, and he will provide the most steady market for Indian industries.

Under these conditions can we hope to have as rapid a process of industrialisation as that of Germany or England? We have neither the capital required, nor the vast markets which are necessary for such a development. The effective market we have got is far smaller in extent than the above-mentioned countries had, and instead of there being an accumulation of capital, we have got a regular drain on it, extending over nearly one-and-half century in the form of "English Charges". We do not think that the facts mentioned above justify us in hoping for an industrial development sufficiently rapid to afford even a partial relief to our agriculture.

It may be said, however, that we have all the while been arguing as if the State in India has nothing to do with its industrial development. Why should the State not foster Indian industries by direct aid, and encourage the growth of Indian capital by the institution of banks and by other ways? Did not the German State of the early seventies encourage its industries by direct State aid and by the creation of the Zollverein?

It is easily admitted that the State, if it has the will, can do much for industrial development. It can develop the mercantile marine, it can prevent foreign goods from competing with Indian; it can give bounties to nascent industries, and follow a comprehensive economic policy for the development of India's resources.

Even the State, in spite of the best intentions, cannot promote the growth of Indian industries to such an extent as to absorb the whole agricultural surplus within a short time. Granting that the State has got the necessary resources, can we say that it can assume or create huge markets for our growing industries? Could the German State for example, have succeeded in bringing about the remarkable transformation if the market for German in-

dustries had been limited to Germany alone? A small country like Germany required the whole world as its market to bring about the remarkable industrial progress that she achieved. Now that our markets will be mainly confined to our own boundaries, can we hope to achieve, even with the aid of the State, what Germany or England succeeded in doing? Again, granting that with the aid of the State we can progress as rapidly as Germany, and this is the maximum that we can expect, the relief that it may afford to our agriculture cannot be sufficient for our purpose, as already pointed out.

Conclusion

To summarize, we have tried in this chapter to consider the argument that industrialisation may prove a solvent of the agrarian problem. We have first taken a rapid survey of the progress of industrialisation in this country, and have found that it has failed to administer any relief to agriculture, and concluded that such a progress will not be able to solve the agrarian problem, and that if industrialisation is to afford a relief, it must progress rapidly.

We have found that in Germany and England agricultural overcrowding was prevented because the industrial movement was a very rapid one, and because the relief needed by agriculture was very small when compared with our requirements. We have then tried to estimate the surplus population living on agriculture and found it to be immense. In this connection we have observed, that even if the process of industrial development in this country were to be as rapid as that of Germany, this will not reduce the overcrowding in agriculture in any great proportion, especially if even a small increase in the population takes place in the meanwhile. We have therefore concluded that what we require is an industrial progress far greater than that of Germany or England. We have

then tried to discuss the possibilities of having such a rapid development in this country. In doing so we have examined the fundamental factors that brought about the Industrial Revolution in Germany and England, and found that the two dominating forces were the amount of capital available, and the extensive markets that could easily be captured. In the case of India we have found that we have neither the one nor the other, and that therefore we cannot hope to bring about a sufficiently extensive development of our industries to relieve agriculture of its heavy burdens.

CHAPTER XII.

CONCLUSION

Retrospect

The foregoing pages reveal a very grave state of affairs concerning the population problem of India. The positive checks to population, which are due to a lack of subsistence, are increasing both in their intensity and extensiveness. At one time they take the form of famines, at another of epidemics, and this is in addition to the great check of malaria which normally operates in the country. We have seen how this clearly indicates a growing maladjustment between population and production. The standard of life is ridiculously low, too low in fact to be called a standard of life at all. It is rather a standard which enforces chronic starvation on millions of people.

Do not these facts force upon us the conclusion that there are more people in this land than it can support; or that this country is suffering from a chronic state of overpopulation? Misery and poverty, the two hall-marks of an overcrowded country are present here in all their nakedness, and to judge from the effects of the positive checks, they seem to be on the increase. They can be clearly taken as indicating the fact that unlike Western Nations, India has failed to anticipate the evil of overpopulation, and having allowed things to drift, is now faced with the Herculean task of curing that evil. The Population Problem of this country has therefore assumed a menacing aspect. We have all the while been travelling down the inclined plane of poverty, and our downward progress might be expected to be very rapid in the future if things continue in the same manner.

We seem to have multiplied to the lowest limit set by subsistence, whereas the ideal that every self-respecting nation should keep in view should be, to arrest the growth of numbers at a point consistent with a high standard of life ; our problem therefore, is not only to maintain the present relation between subsistence and population, but to change it for the better by bringing about an enormous increase in production.

So far as an increase in production is concerned, we have come to the conclusion that the prospects are not bright. We have noted the main defects of our agricultural production, and considered the possibility of relieving agriculture by a process of industrialisation. The amount of relief required by agriculture is however so great, that any scheme of industrial development that we can think of in the light of the experience of other countries, as well as our own, will not be able to cope with it in any reasonable amount of time. Our conclusion with reference to the existing population is that with a steady increase in population, even at a slow rate, the intensity of the problem will grow.

From the above it will be clear that what we want is not only that there should be no increase in our numbers, but that our population should go on declining for some years to come. This alone coupled with a rapid industrial activity aided by the State may be able to restore the equilibrium, and thus solve the problem perhaps after a long period.

Suggested Remedies

Bearing this in mind, we shall try to consider the remedy that will prove most effective for us. First, we shall ask ourselves whether postponement of marriage will answer our purpose. Historically, however, this remedy has never been able to find the way out of the Mal-

thusian misery. This will be clear from what has already been said with regard to late marriages. We have, therefore, a very strong reason to believe that in the case of India this measure alone will not be effective. To say this, is not to argue that there should not be late marriages in India or that the age of marriage should not be raised considerably. Our point is that as a remedy for filling up the great gap between population and subsistence in this country, this measure, though it may do some good, is wholly inadequate by itself.

Abstinence during married life is advocated by some as a measure for effectively keeping down the number of births. Without going into the other aspects of this proposal, it can be said that it makes too heavy a demand on the social conscience of the average man who cannot be expected to respond to it.

Birth Control

The only remedy left for us, therefore, is to adopt the more effective method of artificial restriction of births as has been done by nearly all European nations, led by France. We have seen in a former chapter that it was only by recourse to this method, that the great industrial nations of the West have escaped, in recent times, the miseries and horrors which generally follow the working of the Malthusian principle. Why should we then not follow them in their wisdom by adopting this preventive check which has been so effective in its operation? It has not only prevented population from pressing on the means of subsistence, but has also made it possible to have a standard of life which, besides satisfying the necessities of life, leaves some surplus to be utilised for other activities and thus makes life worth living.

It must, however, be remembered that if we adopt this remedy, we shall have to apply it in a more intensified

form than is done in Europe ; for, we have got to reduce our population whereas the problem with Europe was to ensure a relatively slow growth of numbers. The effect of the measure, if largely adopted will be easily obvious within a short time. It will at once put a stop to the evil tendency for the holdings to be sub-divided. It may leave a surplus in the hands of the cultivator by lessening the demand on his poor purse. It will immensely increase the effectiveness of industrialisation as a solvent of the agrarian problem by reducing the surplus to be relieved.

The possibility of the proposed remedy being seriously adopted, can, however, be reasonably questioned. The extreme poverty of the Indian masses, and the fact that they stand in urgent need of a prudential restraint of the type suggested, may act as an insurmountable difficulty towards the adoption of the remedy proposed. It is generally known that discretion of any sort is not to be found among a people who are too poor to hope for any substantial improvement in their lot. The squalid circumstances under which they live, and their blighted outlook on life, prevent them from exercising any foresight with regard to their future ; so much so that if by chance they happen to have a small accretion to their normal income, they will usually squander it on liquor. The fact is that having sunk very deep into the quagmire of poverty, they have no incentive left to subject themselves to any kind of discipline with the view of bettering their future.

If this is so with regard to ordinary forethought, how much more must it be with regard to the prudential restraint which affects the most natural and the most powerful instinct of man? The difficulty thus offered is very great indeed, especially in view of the fact that even in England the adoption of the check came only after the lower classes had a distinct conception of a standard of life which they must maintain at all cost. It was only

when the stakes to be lost by the heavy burden of a numerous family were very high, that people in England began to practise artificial limitation of birth. In India, on the other hand, the masses have no conception of a standard of life to which they must hold. But the problem in India is not merely economic, it has other important aspects.

Birth Control and Indian Social Life

The social and religious traditions of the Indian people will not allow of such a revolutionised outlook on life.¹ The orthodox Hindu delights in the birth of a son who is regarded as a deliverer of his forefathers from hell. The absence of male issue is a social stigma; and a girl unmarried at puberty is a "source of social obloquy". Sterility in a woman is a grievous crime and the Gods must be propitiated to cure the evil. These beliefs are held with the usual tenacity with which all orthodox superstitions, having no rational basis, are adhered to. Even to speak of birth control in such circumstances will be like hurling a bombshell in a peaceful atmosphere. In the first place most of the people concerned will not be even able to comprehend its meaning much less to understand its significance and practise it.

Even if they are made to understand it they will be horrified at the idea of practising it. If there is anything in the whole range of Western life, which is very difficult for India to adopt, it is this mode of limiting families. Long years of strenuous efforts and propaganda must pass before such a remedy is widely adopted in this country. Any hope of getting an immediate relief from this measure cannot therefore be justified in the least.

¹ This was written before the passing of the Sarda Act by which the minimum age at marriage has been fixed. It may be added that in spite of this, the above criticism is substantially true, except in the case of educated classes, who are small in number.

We may then be questioned, why do we propose this remedy at all? The answer is that we do so because we are firmly convinced that this is the only method for the solution of the problem that confronts us. By directing our efforts towards its adoption, we may hope to get out of our misery at least in the distant future. When we say that the above method is the only solution of the problem, we do not mean to suggest that there should be no effort to develop industries in this country. On the other hand we want as much intensive industrialisation as possible. We have already remarked that the State can do much in this direction by adopting a comprehensive economic policy. But, as we have pointed out, industrialisation by itself has never been able to solve the population problem of any country in the world, unless it has been accompanied by this new form of preventive check. As has been clearly shown, Indian Industrialisation cannot hope to touch even the fringe of the great problem that faces this country. It is at best a very feeble palliative; and it will be only a travesty of argument to say that by itself it can be expected to relieve us of our present misery and poverty, and ensure a decent standard of life for the teeming millions of this country. We, therefore, once more reiterate our belief in the efficiency of the remedy proposed, and say that it is the only solution of the problem, in so far as any other proposal to ameliorate the condition of the poverty-stricken masses is bound to fail, if it does not include the operation of this preventive check.

Before concluding we may note that birth control has been objected to by many people on ethical grounds. We do not wish to discuss these objections because we do not claim any expert knowledge in ethics. If what is more humane and conducive to the happiness of humanity can be taken as ethical, then surely birth control cannot be attacked as immoral, for, as has been already shown,

it has prevented much suffering and misery in Western nations, and has raised a considerable section of humanity from poverty.

In the case of India it will do still greater wonders. It will prevent the enormous social and economic loss involved in the terrible infant mortality of this country. It will completely put a stop to the sad tragedy which is being daily enacted in nearly every Indian house, where girl-mothers of tender ages are driven to premature graves dug for them by cruel social customs, ignorant parents and imprudent husbands. One is almost tempted to say that even if the control of births were to abolish only this sad feature of Indian life, its practice would be justified in the eyes of every humanitarian who has the welfare of the millions of Indians at heart. Is it not more moral to prevent the births of children and enable young wives to live long usefully and happily, than allow them to die by thousands in the process of giving birth to or rearing too many children, most of whom do not survive for a single year?

To conclude, in our opinion what India wants for a healthy economic life is a definite reduction in her population, and this can be best achieved by a resort to restrictive measures for controlling births. We are aware of the many limitations to such a remedy, and also of the vast difficulties that will have to be overcome before it can operate effectively. But we still prefer to stand by it because, in our opinion, History has furnished no better alternative to escape the rigours of the Malthusian Principle.

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